

PORT OF MANCHESTER.



ANNUAL REPORT

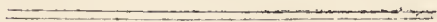
OF THE

Medical Officer of Health

TO THE

PORT SANITARY AUTHORITY,

1904.



*ORDERED BY THE PORT SANITARY AUTHORITY TO BE PRINTED,
1st May, 1905.*




MANCHESTER:

H. SNAPE & SONS, 6, VICTORIA STREET,
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PORT OF MANCHESTER.

Limits of Jurisdiction of the Manchester Port Sanitary Authority—RED.

Hospitals where Infectious cases can be removed, under certain conditions, from vessels bound for or within the Port of Manchester—X

1. Liverpool Small-pox Hospital.
2. Liverpool Cholera, Plague and Yellow Fever Hospital.
3. Wirral Small-pox Hospital.
4. Wirral Infectious Diseases Hospital.
5. Runcorn Infectious Diseases Hospital and Small-pox Sheds.

6. Widnes Infectious Diseases Hospital.
7. Warrington Infectious Diseases Hospital.
8. Salford Infectious Diseases Hospital.
9. Salford Small-pox Hospital.

1874
LIVERPOOL

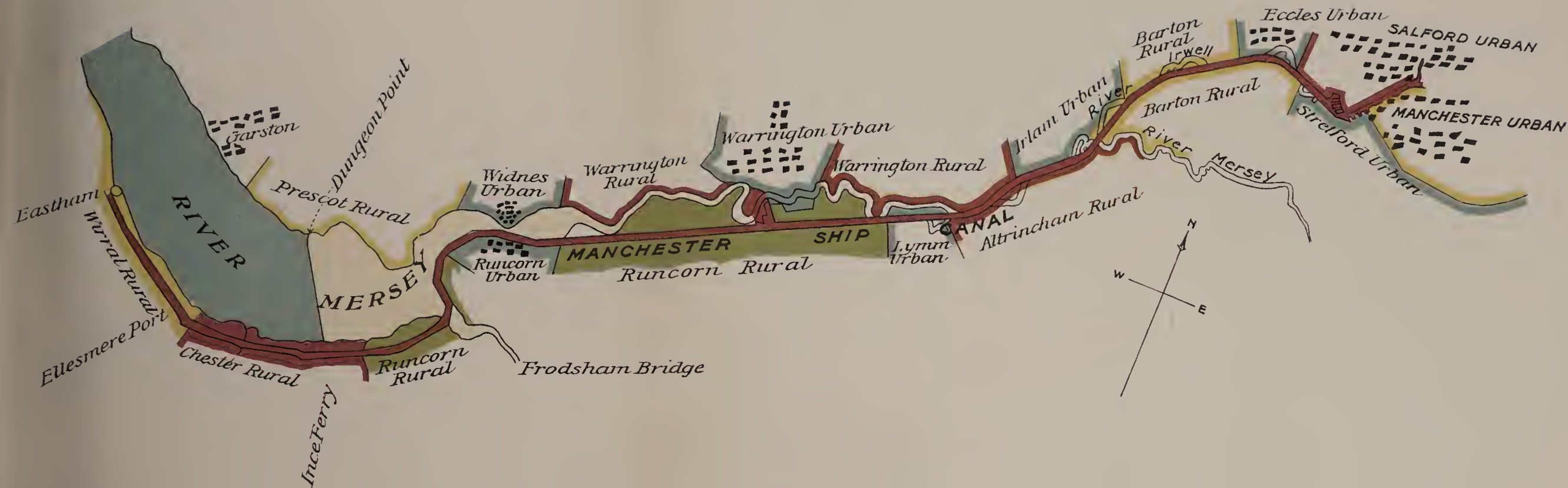


CHART SHOWING THE SANITARY DISTRICTS ABUTTING ON THE
PORT OF MANCHESTER.

PORT OF MANCHESTER.

TO THE CHAIRMAN AND MEMBERS OF THE MANCHESTER
PORT SANITARY AUTHORITY.

GENTLEMEN,

I beg to submit to you the Eighth Annual Report of your Medical Officer of Health.

I would congratulate your Authority on the absence of serious sickness during the past year.

The amount of work done compares most favourably with that of previous years. More work has been accomplished during the past twelve months, than at any previous period since the Authority was established.

I have the honour to be, Gentlemen,

Your obedient Servant,

A. M. N. PRINGLE,

Port Medical Officer.

MANCHESTER PORT SANITARY AUTHORITY.

The Authority is composed of the following Members:—

Mr. Alderman Walton Smith, Manchester, *Chairman*.

Mr. Councillor Huddart, Salford, *Deputy Chairman*.

Mr. Councillor W. F. Dearden	}	Manchester.
„ „ T. Hassall ...		
„ „ H. Marsden ..		
Mr. Alderman W. Stephens ...	}	Salford
„ „ J. J. Meakin ...		
„ „ E. Desquesnes		
Mr. Councillor T. Robinson ...		Stretford
Mr. Alderman Nathan Parr ...	{	Borough of Eccles.
		R.D. of Barton-upon-Irwell.
		U.D. of Irlam.
Mr. Alderman T. H. Sutton ...	{	Borough of Warrington.
		R.D. of Warrington.
Mr. Councillor T. Dean ...	{	U.D. of Lymm.
		U.D. of Runcorn.
		R.D. of Runcorn.
		R.D. of Bucklow.
Mr. Alderman G. I. Neil ...	{	Borough of Widnes.
		R.D. of Chester.
		R.D. of Wirral.

The Officials of the Authority are as follows:—

Medical Officer of Health—A. M. N. PRINGLE, M.B., C.M. Edin.,
D.P.H. Camb., 15, Salisbury Buildings, Trafford Road, Salford.

Clerk—A. HOLMES, Solicitor, Bexley Square, Salford.

Sanitary Inspectors—H. ATKINSON, C.S.I., 584, Chester Road, Old
Trafford, Manchester.

W. RICHMOND, C.S.I., 22, Waterloo Road, Runcorn.

SICKNESS DURING THE YEAR 1904.

The total number of cases of Sickness investigated during the year was 159.

The numbers for the previous years, since the formation of the Port Sanitary Authority, are as follows:—

1897	...	...	...	16
1898	...	...	...	65
1899	...	...	...	46
1900	...	...	...	71
1901	...	...	...	89
1902	...	...	...	144
1903	...	...	...	124
1904	...	...	...	159

The number of cases this year is thus the highest since the formation of the Authority. That it is so, need occasion no surprise as it is merely the inevitable resultant of the expansion of the Trade of the Port. The number of vessels using the Port of Manchester is steadily increasing year by year. The number of seamen employed on these vessels is increasing fairly equally with the number of vessels, and, as each seaman may be considered as a potential case of sickness, it clearly follows that the actual number of cases of sickness or injury must be on the increase. It also follows that, as the *total amount* of sickness increases, the tendency to increase in any particular form of disease should also be in evidence. It thus arises that the danger of the importation of forms of Infectious Disease is steadily advancing.

In a progressive Port such as Manchester, this unfortunate tendency exhibits itself along two main lines.

1. Danger from the increase in the number of individuals who are, each, possible victims and thereby potential sources of disease, and who, also, as has already been stated, increase in number fairly equally with the expansion of Trade.

2. Danger from the increased area from which infection may be imported.

As the Trade of a Port increases, the advance is not merely limited to an increase in the Trade with the Ports with which commercial relations have already been established, but new lines of communication are opened up with new Countries and Ports, and thus the *area* from which the Trade of a Port draws its traffic increases as the trade expands.

The resultant of this is, that the greater the area with which the Trade of the Port is conducted, the greater becomes the liability to the importation of those forms of disease which are communicable from man to man, and, in the case of plague, from rats to man.

It is thus abundantly clear that the *amount* of shipping dealt with at a Port, only indicates a part of the danger of the Port. Of two Ports with an equal amount of shipping, that one which has the greatest trading area is the one which stands in the greatest danger of the importation of dangerous Infectious Disease.

A Port may truly be considered as a focal point towards which lines of communication converge from all points of the globe. When we consider therefore, that by means of shipping, a direct *personal* communication is established between the inhabitants of widely separated areas, through the agency of those on board ship, either seamen or passengers, in the ordinary course of commerce; and when we recollect that, so far as personal Infection is concerned, it applies to all those forms of communicable Disease which may be prevalent at any of the Ports of call, it is easy to appreciate the fact, that a large Port is in a much more unsatisfactory position from this particular point of view, than one whose trade, for example, is of the coasting type only. Coasting vessels can only disseminate those forms of disease which are already established in the country, whereas foreign vessels can plant in our midst diseases, which, save by the agency of shipping, would never reach our shores. I need only mention as an instructive example of the latter point, the extraordinary spread of Plague within recent years. This disease, which is endemic in certain parts of the East, has within a very short period appeared at such widely separated points as South America, Australia, and the Cape, and its extension is solely due to the influence of Shipping. How far this spread is due to the influence of personal human infection, and how far it is due to the much more insidious, and possibly more

dangerous, influence of rat infection is a matter which cannot be discussed here. Suffice it to say that, though the findings of the Indian Plague Commission in some degree minimise the potentiality of the rat in the matter, a weight of evidence has been accumulated on the point which clearly shows that rat infection constitutes a grave national danger and one, the importance of which cannot be overrated. The lamentable experience of South Africa is fresh in the minds of all. Whether the disease commenced from a human source or not, the fact remains that the persistence of the disease is beyond doubt, in at least a number of the towns, *e.g.* Port Elizabeth, due to the fact that the rats have become infected. In Port Elizabeth infected rats have been found, long after the human Epidemic had subsided, and have given rise to sporadic outbreaks of the disease.

In our own country the recent costly experience of Glasgow corroborates this view.

The following is a brief summary of the facts in connection with the cases of Infectious Disease notified during the year.

The number of cases of dangerous Infectious Disease dealt with on board Manchester bound vessels was as follows:—

Enteric Fever	...	...	8
Scarlet Fever ?	...	...	1

SCARLET FEVER.

The case of suspected Scarlet Fever was that of one of the crew of the s.s. "Salford." The man complained of sore throat and had a slight rash. On observation of the case for a few hours, it was decided to disinfect the cabin and the man's effects as a precautionary measure pending the development of the case. As the man would not go to hospital and as he could be well isolated in his own home, he was allowed to remain there. The subsequent history of the case showed that it was not one of Scarlet Fever.

ENTERIC FEVER.

The number of cases of Enteric Fever removed to hospital at Manchester was three.

Of the remaining five cases, one was removed to hospital at Liverpool, whilst the vessel was discharging part cargo there.

Another case, which occurred on a vessel from which a case was removed to hospital, at Salford, was removed to hospital at London. This case occurred whilst the ship was discharging part cargo in London prior to coming on to Manchester.

The other cases was removed to hospital at Alexandria, Malta, and Riga, one each. These cases were removed during the voyage of the vessel from the port of loading to Manchester.

In addition to the above, two cases of communicable disease occurred. One of these was a case of Scabies which was isolated for a few days at Christiania. The forecastles and the effects of the man were disinfected at Christiania. The sailor was sent back to the vessel immediately before her departure to Manchester. It is very doubtful if the case was one of Scabies.

The other case was one of Zymotic Diarrhœa. The victim who was the infant daughter of the captain of the vessel, was taken ill at Bristol, and died during the voyage up the canal. The history of the case as given, clearly indicated the nature of the illness. The facts were reported to the Coroner, but he did not deem an inquest necessary.

One other case requires mention. This was the case of a man on a coasting schooner, who was suffering from a severe whitlow. The case was reported as one of erysipelas. Examination revealed that the case was not of the nature reported, but that the condition of the patient was due purely to the whitlow. The patient was sent to the Workhouse hospital at Dutton.

SUMMARY OF THE CASES OF SICKNESS OCCURRING DURING THE YEAR 1904.

The following tables give the usual particulars regarding the cases of sickness which have occurred during the year:—

TABLE I.

Accidental Injuries	...	...	...	29
Malarial Fever ...	...	...	...	22
Colds and Influenza	...	...	...	14
Chronic Rheumatism	...	...	...	10
Gastric Enteritis	...	...	...	9
Enteric Fever ...	...	...	...	8
Drowning	...	...	...	7
Phthisis	...	...	...	6
Heart Disease ...	...	...	...	6
Poisoned Wounds	...	...	...	5
Gastric Catarrh	...	...	...	4
Acute Rheumatism	...	...	...	4
Venereal Disease	...	...	...	4
Bronchitis	...	...	...	3
Pneumonia	...	...	...	3
Cirrhosis of the Liver	...	...	...	2
Whitlow	...	...	...	2
Chronic Brights Disease ..	...	...	...	2
Obscure	...	...	...	2
Abcess of the Liver	...	...	...	1
Acute Hepatete	...	...	...	1
Asthma	...	...	...	1
Cervieal Tumour	...	...	...	1
Cerebral Hæmorrhage	...	...	...	1
Enlarged Prostate	...	...	...	1
Fistula	...	...	...	1
Heat Apoplexy...	...	...	...	1
Inguinal Hernia	...	...	...	1
Malicious Wounding	...	...	...	1

Peritonitis	...	...	...	...	1
Paralysis	...	...	...	...	1
Senile Decay	...	...	...	...	1
Scabies?	...	...	...	...	1
Scarlet Fever?	...	...	...	...	1
Zymotic Diarrhœa	...	...	...	...	1
Total				...	<u>159</u>

TABLE II.

The diseases thus summarised may be classified as follows:

Diseases of the Alimentary System	...	21
„ Circulatory „	...	6
„ Integumentary „	...	1
„ Locomotor „	...	16
„ Nervous „	...	3
„ Respiratory „	...	13
„ Urinary „	...	3
Specific Fevers...	...	9
Malarial „	...	22
Influenza and Colds	...	14
Venereal Disease	...	4
Senile Decay, Obscure Disease, etc.	...	5
Total		... <u>117</u>

Injuries—

Accidental	...	29
Malicious	...	1
Poisoned Wounds	...	5
		<u>35</u>
Drowning	...	7
		— 42
Total		... <u>159</u>

TABLE III

The following Table gives the number of cases which were removed to various hospitals, other than those within the Port of Manchester, from Manchester bound ships:—

Removed to Hospital at Alexandria	...	3
„ Liverpool	...	3
„ Philadelphia	...	3
„ New York	...	2
„ Antwerp...	...	1
„ Christiania	..	1
„ Carlsham	...	1
„ Galveston	...	1
„ Glasgow...	...	1
„ Huelva ...	...	1
„ Karachi ...	...	1
„ London ...	...	1
„ Malta ...	...	1
„ Newport...	...	1
„ Plymouth	...	1
„ Porsgrund	...	1
„ Port Said	...	1
„ Riga ...	...	1
„ St. John's	...	1
„ Stockholm	...	1
Total	...	<u>27</u>

TABLE IV.

The number of cases removed to Hospital within the Port of Manchester was as follows:—

Removed to Hospital at Manchester or		
Salford ... ..	...	11
Removed to Hospital at Runcorn...	...	3
„ Warrington	...	1
Total	...	<u>15</u>

TABLE V.

In this table are included those who died at sea from Sickness, together with those who lost their lives through drowning.

Deaths at sea from Disease	...	...	14
Deaths from Drowning ...	...	...	7
			<hr/>
	Total	...	21
			<hr/>

Of the deaths from Drowning, five were Accidental, and two were ascribed to suicide.

None of the deaths at sea, from disease, were due to dangerous Infectious Disease.

TABLE VI.

In this table are inserted the name of the Vessel, the Port whence she sailed, the nature of the sickness discovered, and a few short notes concerning the particulars of the case.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Jan. 9	Emily (sloop flat) ...	Runcorn ...	Widnes ...	Acute Rheumatism ...	The Master had left the boat and gone home.
„ 11	s.s. Lincluden ...	Savannah ...	Salford ...	Enteric Fever ...	The boatswain of this vessel was found to be suffering from symptoms which indicated that his complaint was Enteric Fever. He was at once removed to Ladywell Sanatorium. His clothing, bedding, and all other effects were removed and disinfected by the Salford Authorities. His cabin was washed down with Perchloride of Mercury and then fumigated with Fermalin. The W.C's were thoroughly disinfected. It was not considered necessary to deal with the fresh water tanks. The case proved to be a severe example of the disease.
„ 14	Vamos (Barquentine)	Rio Grande	Runcorn ...	Drowning ...	The Master reported that one of his men had been washed overboard and drowned on the 4th inst.
„ 20	s.s. Thistle ...	Dieppe ...	Weston Point ...	Accidental Injury	The Steward was found to be suffering from a severely injured hand.
„ 21	s.s. Jessie ..	Pwllheli ...	Widnes ...	Influenza ...	The Master was found to be laid up.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Jan. 22	s.s. Vrill	Fowey	Runcorn	Accidental Injury	One of the sailors was found to be suffering from a severe injury to his face.
" 26	s.s. Castillian Prince	Alexandria ..	Salford	Accidental Injury	The Chief Officer was found to be laid up with an injured toe the result of an accident.
" 27	Irish Minstrel (schooner)	Par	Runcorn	Accidental Injury	One of the seamen was removed to the hospital at Runcorn suffering from a severely injured foot.
" 28	s.s. Mimi Horn ...	Mobile	Salford	Bronchitis ..	One of the firemen was removed to hospital at Liverpool, suffering from Bronchitis. The Chief Engineer also went to hospital at Liverpool, and was examined by the Doctor, but was not detained. He was quite well on arrival here.
Feb. 1	s.s. Asiatic Prince ..	Alexandria ...	Salford	Pneumonia ...	The Master reported that one of his crew was removed to hospital at Alexandria, suffering from pneumonia
" 18	s.s. Barbro	Dramen	Salford	Phthisis	One of the firemen was found to be suffering from incipient phthisis. He was ordered to be discharged on the arrival of the ship in Denmark, whither she was bound.
" 22	s.s. Britannia	Glasgow	Salford	Pneumonia ...	The Chief Officer reported that one of the crew, a Lascar, had died in Glasgow from Pneumonia.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Feb. 22	s.s. Crosby Hall ...	Bombay	Salford	Malarial Fever ..	The Mate reported that one of the crew was suffering from Malarial Fever. On examining the man I found he was recovering from the disease, though not quite convalescent.
" 24	s.s. Domino ...	Stettin	Runcorn	Accidental Injury..	One of the seamen was found to be laid up, suffering from the effects of accidental injuries to his ribs.
" 26	s.s. Neva	Stockholm...	Salford	Venereal Disease..	The Master reported that one of the crew was left behind in hospital at Stockholm, suffering from Venereal disease.
" 29	s.s. Helge	Gothenburg ..	Salford	Accidental Injury...	The Mate reported that one of the crew had been severely injured at sea by being thrown against the wheel by a heavy sea. On examining him, he was found to be progressing favourably.
" 29	s.s. Mara Kolb ...	Rosario	Salford	Heart Disease ...	One of the sailors was found to be suffering from advanced heart disease. He was unfit for duty, and was ordered to be paid off.
Mar. 3	s.s. Chickahominy ...	Port Limon ...	Salford	Influenza	The Chief Engineer reported that one of the firemen had been laid up during the voyage, suffering from influenza.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Mar. 2	s.s. Manchester Commerce	St. John ...	Salford ...	Diabetes ...	The Third Officer was found to be suffering from advanced diabetes.
„ 13	s.s. Genesee ...	Philadelphia ..	Davyhulme ...	Enteric Fever ...	I received a telegram from the Liverpool Customs that there was a case of sickness on this boat. The boat was met at Barton Lock, and on examination it was found that one of the sailors was suffering from Enteric Fever. He was at once removed to the Ladywell Sanatorium. His effects and bedding, etc., were removed to the Mode Wheel disinfecting station. His cabin was thoroughly disinfected by the Salford Authorities. All the rest of the crew were well with the exception of one of the sailors who was ordered to be sent to the Salford Royal Hospital, as he was incapacitated from duty by a severe injury to his right leg.
„ 15	Island Maid (schooner)	Teignmouth ..	Runcorn ...	Gastric Catarrh ...	The Mate was found to be suffering from a severe attack of acute Gastric Catarrh.
„ 19	s.s. Manchester Shipper	New Orleans .	Salford ...	Accidental Iniury	One of the sailors was found to be laid up with a severe injury to his foot, the result of an accident. He was sent to the Salford Royal Hospital.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Mar. 24	s.s. Stakesby...	Huelva ...	Salford ...	Cirrhosis of Liver...	The Mate reported that one of the firemen was removed to Hospital at Huelva, suffering from Jaundice and Dropsy. The man was probably suffering from Cirrhosis of the Liver.
" 24	s.s. Ivy ...	...	...	Enteric Fever ...	A bag of clothes which had belonged to a seaman from the s.s. Ivy was shipped by the British Consul at Revel, in Russia, on the s.s. Trieste, and sent across to this country. A note was sent at the same time asking the disinfection of the bag as the man had died from Typhoid Fever in Revel. The bag was handed over to the Salford Authorities and disinfected by them. After disinfection, the bag was handed over to the Board of Trade in accordance with the usual custom. Enquiries were made on the s.s. Ivy as to the symptoms from which the man had suffered. I think there is no doubt but that the case was one of Enteric Fever. I am unable to understand why the authorities at Revel did not attend to the disinfection themselves.
April 11	s.s. Cervantes ...	New York ..	Salford ...	Gastric Catarrh ..	The Mate reported that one of the sailors had been in Hospital in New York whilst the ship was in that port. The man was returned to the ship before she left the port in the same

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
April 16	s.s. Aston Hall ...	London ...	Salford ...	Cold ...	The Third Officer was found to be laid up, suffering from a severe cold
" 16	Harvest Queen (schooner)	Charlestown	Runcorn ...	Poisoned Wound...	One of the sailors was reported to have been sent to Hospital at Newport, Mon., suffering from blood poisoning, the result of a poisoned wound on his leg.
" 19	s.s. Peik ...	Porsgrund...	Ellesmere Port ...	Rheumatic Fever..	The Master reported that he had left one of his crew in Hospital at Porsgrund, suffering from Rheumatic Fever.
" 19	s.s. Maggie Barr ..	Harrington	Widnes ...	Diarrhoea ...	One of the sailors was paid off, suffering from chronic Diarrhoea.
" 20	C. S. Atkinson (schooner)	Liverpool ...	Runcorn ...	Influenza ...	The Mate was found to be laid up, suffering from Influenza.
" 23	s.s. Thespis ...	New York...	Salford ...	Gastro Enteritis ...	The ship's doctor reported that one of the passengers, on the voyage from Santos to New York, had died at sea from gastro enteritis, and had been buried at sea on the 27th March.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
April 23	s s. Ameland ...	Porsgrund ...	Salford	Bronchitis & Asthma Accidental Injury...	One of the sailors was found to be suffering from Bronchitis and Asthma. He was ordered to be paid off. The Boatswain was found to be incapacitated from duty on account of a severe accidental injury to his back.
” 24	s.s. Creole Prince ...	Alexandria via London	Salford	Enteric Fever ...	The cook was found to be suffering from Enteric Fever. He had been ill probably seven days, though he had not laid up until the day previous to the discovery of his illness. He was at once removed to Ladywell Sanatorium. His cabin was thoroughly disinfected. All his effects, bedding, etc., were removed to the Salford disinfecting station and thoroughly disinfected. On enquiry it was found that one of crew had been removed to the Isolation Hospital in London, suffering from what was stated to be mild enteric fever. Enquiries revealed that the nature of this case was very doubtful. The London Port Sanitary Authority thoroughly disinfected the crew's quarters, the closets, and emptied and cleansed the water tanks. On this account it was not considered necessary to deal with these at this port.
” 27	Wm. Sheppard (schooner)	Rye	Weston Point ...	Heart Disease ..	The Mate left the ship suffering from advanced heart disease

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
May 2	s.s. Gascony ...	Ghent ...	Salford ...	Rheumatism ...	The Master reported that the mate was sick. On examination it was found that he was suffering from chronic rheumatism.
" 4	s.s. City of Oxford ...	Glasgow ...	Salford ...	Malarial Fever ...	One of the Lascars was found to be suffering from Malarial Fever
" 7	s.s. Appomattox ...	Avonmouth ...	Salford ...	Incipient Phthisis	One of the sailors was found to be suffering from severe hæmoptysis. He was at once removed in the ambulance to Hope Hospital. He was suffering from incipient phthisis, of which hæmoptysis is a prominent symptom.
" 11	s.s. Cyprian Prince ...	Alexandria ...	Salford ...	Fistula ...	The Master reported that one of his crew was removed to hospital at Alexandria, suffering from fistula.
" 12	s.s. Grampus...	Glasgow ...	Pomona ...	Drowning ...	The Master reported that one of the firemen jumped overboard on the voyage round from Glasgow and was drowned.
" 20	s.s. Salford ...	Salford ...	Salford ...	Scarlet Fever?	A report was received that one of the men was under medical care, in his own house, suffering from suspicious symptoms of scarlet fever. On examination of the man, it was decided to disinfect his cabin as a precaution, though it was not considered advisable to remove him from his own house, where he could be properly attended

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
May 21	s.s. Sophie ...	Portsmouth ..	Weston Point ...	Accidental Injury .	to. His clothes and bedding, which had been left in his cabin, were removed and disinfected at the same time. The case ultimately proved not to be one of scarlet fever.
" 21	Springburn (sailing ship)	Sydney ...	Weston Point ..	Uncertain ..	The Chief Engineer was found to be laid up, severely injured, the result of having fallen down the hold whilst the vessel was at sea. He was under medical care.
" 30	s.s. Clan Grant ...	Glasgow ...	Salford ...	Cirrhosis of Liver Accidental Injury..	I received a report that an apprentice had died at sea on the 13th April. Enquiries showed that the boy had been ailing for a considerable time. Eventually several large ulcers developed on his legs. As these grew larger he gradually grew weaker, and eventually died on the above date, and was buried at sea. The precise nature of his illness was obscure.
" 21	s.s. Manchester Port	River Plate ...	Salford ...	Abcess of the Liver	The lamp trimmer and second tindall were found to be laid up. The lamp trimmer was suffering from Cirrhosis of the Liver. The tindall was suffering from the effects of a severe scald on one of his feet. Both men were unfit for duty.
					The Master reported that on the 4th February, whilst the vessel was on passage from Cardiff to Rio Janeiro,

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
June 25	s.s. Alexandra	Penmaenmawr	Runcorn	Paralysis	The Mate reported that the Master had left the ship and gone to his home, as he was suffering from paralysis.
" 27	s.s. Suram	Batoum	Barton	Pneumonia	The Chief Officer reported that one of the sailors, aged 54, laid up on the 21st May, on the passage from Newport to Batoum, and died on the 29th May from inflammation of the lungs. All the rest of the crew were well on arrival, and there were no other cases of sickness during the voyage.
"	Express, schooner	Teignmouth	Runcorn	Accidental Injury	One of the sailors had his foot badly crushed between the ship's side and another ship at Runcorn, and was off duty in consequence.
" 30	s.s. Eva	Lulea	Ellesmere Port	Accidental Injury	The Chief Engineer broke his foot about three weeks ago, but was now convalescent.
July 2	s.s. Lyng	Vyburg	Acton Grange	Drowning	The Master reported that on the 22nd June one of the sailors was drowned in the Canal during the vessel's stay there.
" 4	Amanda (schooner)	Newquay	Weston Point	Asthma	The Master reported that one of the sailors was laid up with asthma.
" 5	s.s. Manchester Mariner	Buenos Ayres	Salford	Phthisis	The Chief Officer reported that one of the A.B.'s died at Rio from internal hæmorrhage. Cause of death was advanced phthisis with hæmoptysis.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
July 6	s.s. Galgorm Castle...	Balbiggan ...	Weston Point ...	Drowning ...	The Chief Engineer was drowned whilst bathing in the Weston Point Basin at night.
" 11	Elma (schooner) ...	Teignmouth ...	Runcorn ...	Accidental Injury	The Mate reported that the Master of the vessel was put ashore at Arklow on the 4th July, suffering from a badly sprained foot.
" 13	s.s. Briardene ...	Halifax ...	Salford ...	Unknown ...	The Chief Officer reported that the steward, a Chinaman, died on the passage from Greenock to Ship's Harbour on the 3rd June, and was buried the same day at sea. Cause of death unknown, but probably due to old age.
" 16	s.s. Persian Prince ...	Alexandria ...	Salford ...	Enteric Fever ...	The Chief Officer reported that a case of Enteric Fever was removed to hospital at Alexandria and another to hospital at Malta. On enquiry it was found that the Second Engineer was removed to hospital at Alexandria on the 20th June, and the Mess-room Steward was removed to hospital at Malta on the 24th June for purposes of observation. The cases proved to be Enteric Fever. The clothes belonging to the crew were taken on shore at Alexandria for disinfection, and the crew's quarters disinfected. The two patients were the only members of the crew who

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
July 16	s.s. Argyle ...	Fredrikstad ...	Salford ...	Scabies ...	<p>bathed in the dock at Tunis, and there was no other case of sickness amongst the crew. The water tanks were ordered to be pumped out, cleansed and disinfected, and the water closets were also ordered to be thoroughly cleansed and disinfected. All the rest of the crew were well on arrival in Manchester.</p> <p>The Chief Office reported that one of the A.B.'s was removed to hospital at Christiania on the 2nd inst. suffering from the Itch. He remained in hospital till the 4th when he re-joined, the ship. All his effects were sent on shore for disinfection, and the fore-castle was afterwards cleansed and disinfected with carbolic acid. No other member of the crew suffered from the disease, and the man himself was quite well on arrival here. It is probable that the disease was a simple excema.</p>
" 21	Capulla (barque) ...	Lovisa ..	Runcorn ...	Heart Disease ...	<p>The Mate was found to be suffering from general dropsy, the cause of which was heart disease. As he was unfit for duty he was ordered to leave the ship, which he did.</p>
" 21	s.s. Manchester Commerce	Montreal ...	Salford ...	Incipient Phthisis ...	<p>One of the firemen had complained for a few days of pains in the chest. On examination he was found</p>

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
July 22	s.s. Horsa ...	Mobile ...	Mode Wheel ...	Accidental Injury...	to be suffering from incipient phthisis. He was ordered to be paid off as unfit for duty.
" 26	Catherine Renney (ketch)	Par ...	Ellesmere Port ...	Diarrhoea ...	One of the firemen was suffering from a bad eye, the result of being struck with a winch handle.
" 27	s s. Turtle ...	Tobermory ...	Pomona ...	Accidental Injury...	The Master reported that all the crew suffered from a bad attack of diarrhoea on the voyage from Par.
" 29	Katie (schooner) ..	Plymouth ...	Weston Point ...	Accidental Injury...	The Master was killed on the railway, close to the vessel while in Pomona Dock, at 1 a.m.
Aug. 2	s.s. Weehawken ...	Philadelphia ...	Davyhulme ..	Acute Gastric Cattarrh	The Master reported that one of the sailors fell from aloft and sustained severe injuries about the head, and also broke several ribs. He was removed to hospital at Plymouth.
, 5	s s. Watchful ...	Bristol ...	Pomona ...	Zymotic Diarrhoea	The Steward was suffering from pains in the stomach, and was being attended by a doctor. The nature of the illness was acute gastric catarrh.
					A baby, aged 9 months, daughter of the Captain, was taken to a doctor at Bristol, a week ago, suffering from vomiting and diarrhoea. These symptoms continued unabated, and the baby, which was a strong and healthy

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Aug. 12	P. G. Blanchard (barque)	Dalhousie ...	Runcorn ...	Chronic Rheumatism	child, wasted with great rapidity. Its death took place at 11 a.m. on the 5th August. The cause of death was undoubtedly as stated. The case was reported in detail to the Coroner for the County of Lancashire (Pomona Dock No. 2 being in the District of Stretford). The Coroner decided that an inquest was not necessary.
„ 16	Actæon (barque) ...	Pictan ..	Runcorn ...	Chronic Rheumatism	The Master reported that one of the sailors was under the charge of a doctor in Runcorn. The man was found to be suffering from chronic rheumatism. He was not fit for duty.
„ 18	Isabella (ketch) ..	Plymouth ...	Runcorn ...	Poisoned Wound...	The Master reported that the Mate had been laid up for three days, suffering from the effects of chronic rheumatism. There is no doubt but that this was due to the damp state of his bedding, owing to the leaky state of the deck over his bunk.
„ 20	Mary Eliezer (ketch)	Teignmouth	Runcorn ...	Diarrhœa ...	The Mate was found to be suffering from a severe poisoned wound in his hand. He was so ill as to be incapacitated from duty.
					The Master had been suffering from a severe attack of diarrhœa for several days.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Aug. 25	s.s. Eleanor ...	Rotterdam ..	Warrington ...	Phthisis ...	The Master was found to be suffering from advanced phthisis. He was in a low state, and he was leaving his ship, as he was unable to discharge his duties any longer.
Sept. 5	s.s. Fusilier ...	London ...	Pomona ...	Cold ...	The Chief Officer reported that the Second Officer left the ship at London and went to his home, suffering from a severe cold.
" 5	Oskar (barque) ...	Bay of Fundy ...	Runcorn ...	Influenza ...	The Master reported that the Steward had left the ship at Runcorn, and had been seen by a doctor, who told him to leave the ship, as he was suffering from post influenza debility.
" 6	Mary Watkinson (schooner)	Poole ...	Ellesmere Port ...	Cervical Tumour...	The Mate was suffering from a tumour on the neck.
" 9	s.s. Baltico ...	St. Johns ...	Salford ...	Accidental Injury	The Second Mate reported that whilst at St. Johns the Engineer's Steward fell in the tunnel and broke his leg. He was removed to hospital during the vessel's stay there.
" 13	s.s. Clan Sinclair ...	Glasgow ...	Salford ...	Venereal Disease..	The Chief Officer reported that one of the sailors (a Lascar) was suffering from venereal disease.
" 19	s.s. Fusilier ...	London ...	Pomona ...	Bronchitis...	The Chief Engineer reported that the Second Engineer left the vessel on her arrival at London on the 11th inst., suffering from Bronchitis.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Sept. 20	Swallow (sloop)	Penmaenmawr	Runcorn	Retention of Urine	The Master was reported to have left his boat and gone into hospital at Runcorn to be treated for retention of urine.
" 20	Guyane (barquentine)	Oskersan	Illesmere Port	Cold	The Master reported that one of his crew was laid up suffering from severe cold.
" 21	Amy (canal boat)		Manchester	Cold	The daughter of the Captain was laid up with a severe cold.
" 23	s.s. Port Darwin	Riga	Runcorn	Heat Apoplexy	The Master reported that one of the firemen died at sea on the 11th July from heat apoplexy. The body was buried at sea the same day.
" 26	s.s. Persian Prince	Alexandria	Salford	Chronic Rheumatism	One of the sailors was removed to the Salford Royal Hospital, suffering from chronic rheumatism. He had been laid up all the voyage home, quite unfit for duty.
Oct. 4	Ellen (canal boat)		Manchester	Chronic Rheumatism	The Master left the boat and went to his home, as he was incapacitated from duty by chronic rheumatism.
" 7	s.s. Anselma de Larrinag	Galveston	Salford	Whitlow	One of the firemen had been laid up for a few days with a severe whitlow, which gave rise to symptoms of blood poisoning. He was ordered to be paid off, and was sent to his home.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Oct. 12	s.s. Dotterel ...	Rotterdam ...	Salford ...	Blood Poisoning ...	The Master left the ship as soon as she tied up. He went to Liverpool in order to undergo treatment for a swelling on his groin, which was due to blood poisoning.
„ 13	Algernon and Ernest (canal boat)		Runcorn ..	Senile Decay ..	The Master was laid up in bed, suffering from general breakdown. He was a very old man, and without there being any actual disease, was clearly slowly dying.
„ 17	s.s. Furtor ...	Karachi ...	Salford ...	Acute Rheumatism	The Chief Officer reported that the Chief Steward was removed to hospital at Karachi, suffering from acute rheumatism. The Cook was removed to hospital at Port Said on the passage home, suffering from acute gastric catarrh,
„ 17	Emily (schooner) ...	Wade Bridge ...	Runcorn ...	Acute Gastric Catarrh Whitlow ...	It was reported that one of the seamen had been removed to hospital at Runcorn, suffering from Erysipelas. I made enquiries on the spot, and found that the man had been suffering for a few days from a swollen hand. On arrival at Runcorn he went to a doctor, who told him he had Erysipelas. The Medical Officer of Health, however, on seeing the man, recognised that the case was not one of Erysipelas but of simple Whitlow. The cause of the Whitlow was a poisoned

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Oct. 19	s.s. Mercedes de Larrinaga	Galveston ...	Salford ..	Malarial Fever ..	<p>wound on the hand. The man was very ill, and was sent to the work-house hospital at Dutton. The boat came into Runcorn on Sunday morning.</p> <p>The Captain reported that the donkey-man died at sea on the 4th October, and was buried at sea on the same day. The man had been ill for over a week. His symptoms were vomiting, pain in the region of the spleen, fever, and œdema of both legs. From the first incidence of his illness he gradually became worse and died as stated. There is little doubt, from the nature of his illness, that the cause of death was Malarial Fever of a low type. Another fireman was found to be convalescing from an illness of which the symptoms were identical with those described in the case of the donkeyman. As the man was in a very low and weak state, he was ordered to be removed to the Salford Royal Hospital. This order was at once carried out.</p>
" 22	s.s. Aras ...	Batoum ...	Davyhulme ..	Chronic Rheumatism	<p>One of the sailors left the ship at Manchester and went to the Salford Royal Hospital, suffering from Chronic Rheumatism.</p>

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Oct. 24	s.s. Aureole ...	Batoum ...	Barton ...	Stab ...	The Master was stabbed in four places by a thief in his cabin at Batoum. He was severely injured, and was laid up during the passage home. One of the sailors was removed to hospital at Warrington, suffering from compound fracture of both legs. The accident occurred at Latchford Locks, and was due to the tearing away of the hawse pipe by a wire hawser, the hawser then coming against the man's legs and fracturing them. One of the firemen was severely scalded in the engine-room during the voyage home. He was laid up for a few days.
" 24	s.s. Straits of Menai	River Plate ...	Salford ...	Chronic Bright's Disease	The Chief Steward was found to be suffering from chronic Bright's Disease. He was advised to leave the ship.
" 26	s.s. Whimbrel ...	Ghent ...	Salford ...	Accidental Injury...	One of the seamen was found to be laid up with an injured foot, the result of an accident.
" 29	s.s. Fearless ...	Hamburg ...	Salford ...	Cold ...	The Chief Engineer was found to be suffering from a cold.
" 31	s.s. Lincairn...	Savannah ...	Salford ...	Malarial Fever ..	The Master and Chief Steward were both found to be suffering from severe attacks of Malarial Fever. The case of the Master was the most severe.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Nov. 4	s.s. Clan Mackay ...	Glasgow ...	Salford ...	Malarial Fever ...	One of the Lascars was found to be suffering from a mild attack of Malarial Fever.
" 4	Casma (barque) ...	Carlsham ...	Ellesmere Port ...	Accidental Injury...	One of the sailors was reported to have been removed to hospital at Carlsham, suffering from a severe accidental injury to his knee. He was left behind in hospital.
" 11	s.s. Inchdune ...	Mobile ...	Salford ...	Malarial Fever ...	One of the sailors was removed from the ship at Norfolk, Virginia, to hospital, suffering from Malaria. The Mate also fell ill with Malaria Fever after leaving Mobile, and died whilst the vessel was in Liverpool on November 2nd. The forecastle, Mate's berth, and all the W.C.'s were disinfected and afterwards washed with a solution of carbolic acid by the Liverpool Port Sanitary Authority at Liverpool. All were well on arrival at this port, and the vessel was found to be in a clean sanitary condition.
" 15	s.s. Marie ...	Stettin ...	Salford ...	Accidental Injury...	The Second Mate was found to be suffering from a poisoned wound of the hand, caused by a nail having been accidentally run into it. The man was under medical care.
" 16	s.s. Crineas ...	Huelva ...	Salford ...	Accidental Injury...	One of the firemen was found to be incapacitated from duty owing to an injured hand, the result of an accidental injury.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Nov. 18	s.s. Manchester Corporation	Philadelphia ...	Salford ...	Chronic Rheumatism	The Chief Engineer was found to have been suffering from chronic rheumatism during the passage home. He was considerably better by the time the ship arrived in port.
" 22	s.s. Rosario ...	Riga ...	Salford ...	Enteric Fever ..	The Chief Officer reported that one of the firemen was removed to hospital at Riga on the 26th October. The patient died on the 7th November. The for:castles, W.C.'s, etc., were thoroughly disinfected and cleansed. No further cases of sickness had occurred, and all were well on arrival at this port. As an additional precaution a bag of clothes belonging to the deceased, which had been taken to the Board of Trade office here, was removed by the Salford Authorities for disinfection by their steam disinfectors.
" 23	Eliza (flat) ...	Liverpool ...	Runcorn ...	Chronic Rheumatism	The Master was found to be suffering from chronic Rheumatism. He had been laid up, off and on, for about 12 weeks.
" 23	s.s. Aston Hall ...	Glasgow ...	Salford ...	Chronic Bright's Disease	The Cassab (lamp trimmer) was found to be laid up with marked oedema of both feet, extending well above the ankle. The man, who was about 70 years of age, was suffering from Bright's Disease

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Nov. 25	s.s. Saxon ...	Fowey ...	Weston Point ...	Diarrhoea ...	The Master was found to be suffering from a severe attack of diarrhoea.
Dec. 1	s.s. Canute ...	Riga ...	Ellesmere Port ..	Accidental Injury...	The Master reported that one of the firemen fell down the bunker hatch on the 6th November, and succumbed to his injuries the next day. The body was buried at sea.
" 1	s.s. Maria de Larrinaga	Galveston ...	Salford ...	Phthisis ...	The Master reported that one of the sailors died of Phthisis on the 10th November on the voyage home. The body was buried at sea the following day. The man had been under treatment by a doctor at Galveston, who certified that the illness was phthisis.
" 7	s.s. Ottawa ...	Philadelphia ...	Mode Wheel ...	Malarial Fever ...	The whole crew were reported to have been suffering more or less from Malarial Fever on the Mexican coast. Probably the fever was contracted at Tampico, a port in Mexico. All were well on arrival in Manchester, though several of the crew were in a week and debilitated state The Bosun was found to be suffering from a right Inguinal Hernia, the result of a strain. He was advised to be paid off, and was instructed to put himself under surgical care as soon as possible.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Dec. 7	Garston (canal boat)		Runcorn ...	Diarrhoea ...	The Master was found to be laid up with a severe attack of Diarrhoea. The condition of the patient was undoubtedly due to the foul condition of the drinking water, which was supplied from a rotten cask.
" 7	s.s. Ville d' Eu ...	Treport ...	Weston Point ...	Cold ...	The Mate was found to have left the vessel and gone to his home, suffering from a severe Influenzal Cold.
" 7	s.s. Anna Tiede ...	Hamburg ...	Salford ...	Influenza ...	One of the sailors was found to have been laid up for about four days, suffering from an Influenzal Cold, the result of exposure.
" 13	s.s. Taunton ...	Fremington ...	Weston Point ...	Cold ...	The Master was found to be confined to his bunk, suffering from a severe cold.
" 14	s.s. Lucifer ...	Novorossisk ...	Barton ...	Acute Rheumatism Cerebral Hæmorrhage Accidental Injury...	One of the sailors was removed to the Manchester Infirmary, suffering from acute Rheumatism. He had been laid up for several days. The Chief Steward was also removed to the Infirmary, suffering from the effects of Cerebral Hæmorrhage. His condition was serious. One of the firemen fell into the stokehold and injured his back. The injury was not serious and was treated by Dr. Bold.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Dec. 14	Water Lily ... (canal boat)		Ellesmere Port ...	Cold ...	The wife of the Master was found to be laid up in bed, suffering from a severe cold.
" 16	s.s. Mercedes de Larrinaga	Galveston ...	Salford ...	Venereal (Syphilis)	The Chief Officer reported that one of the stewards was removed to hospital at Galveston, suffering from Venereal Disease.
" 16	s.s. Haldan ...	Gothenburg ...	Salford ...	Cold ...	The Mesroom boy was found to be laid up, suffering from a severe cold.
" 19	William Gilmore (schooner)	Poole ...	Runcorn ...	Drowning ...	The Mate of this vessel was drowned accidentally at Runcorn on the 18th December. The man fell into the dock whilst boarding the vessel at night.
" 19	s.s. Greenbrier ...	Jamaica ...	Salford ...	Malarial Fever ...	The donkeyman was found to be suffering from the effects of an attack of Malarial Fever. He was ordered to stay ashore for a month. One of the firemen was laid up with a broken leg, the result of an accident.
" 21	s.s. Thirlmere ...	Valencia ...	Salford ...	Accidental Injury...	The Chief Engineer reported that one of the firemen had severely injured two of the fingers of his right hand, and had gone to the Salford Royal Hospital for treatment.

Date	Name of Vessel	Where from	Where Inspected	Sickness	REMARKS
Dec. 27	s.s. Castleventry ...	Savannah ...	Salford ...	Heart Disease ...	The Chief Officer reported that one of the firemen died at sea on the 6th November, and was buried at sea. The cause of death was heart disease.
„ 28	s.s. Avis ...	Halmstadt ...	Salford ...	Fatty Degeneration of the Heart	The Master of this vessel was taken ill suddenly on this date with symptoms of Cardiac failure. Dr. Bold was called in to see him, but he died about half-an-hour afterwards. The cause of death was certified as stated. The body was removed to the mortuary at Trafford Road,
„ 29	Rhoda Mary (schooner)	Charlestown ..	Runcorn ...	Venereal Disease...	The Master reported that the Second Mate was removed to hospital at New Ferry on the 27th inst., suffering from Venereal disease.
„ 29	s.s. Domino ...	Copenhagen ...	Salford ...	Chronic Rheumatism	The Second Mate left the ship and went to his home, as he was unfit for duty owing to Rheumatism.
„ 29	s.s. Yucatan ..	New Orleans ..	Salford ...	Drowning	The Master reported that one of the quarter-masters was washed overboard by a heavy sea and drowned, and that the Second Mate had his leg broken by the same sea. The Mate was removed to hospital at Liverpool
„ 31	s s. Thor ...	Valencia ...	Salford ...	Accidental Injury..	One of the firemen was found to be incapacitated from duty owing to an injured hand.

INTERNATIONAL SANITARY CONFERENCE,
PARIS, 1903.

In the latter end of 1903, an International Sanitary Conference, was held in Paris. The proceedings of the Congress, and the Resolutions arrived at have now been published. I purpose now to refer to that part of the proceedings which refers to the measures which the Conference recommends to be adopted in the case of plague.

So far as human plague is concerned, the Convention places the question of the mode in which actual cases shall be dealt with on a sound scientific basis, with the result that the ancient and obsolete system of quarantine has been relegated to the limbo of discredited absurdities. This system, which was based upon no scientific data, but which sprung from a feeling of blind, unreasoning fear, which is ever the accompaniment of insufficient knowledge and of the necessary corollary thereof, namely uncertain and haphazard systems of dealing with the object of dread, is now happily no more. In its place the system of isolation of the sick, and observation and surveillance of "Contacts" has been adopted, a plan of procedure which is in accordance with the known facts concerning the mode of spread of disease and with the scientific principles of its prevention.

I.

When therefore a case of this disease occurs on a seaman or passenger, the Sanitary Authority know, or ought to know, precisely what to do. They have :—

1. To isolate the sick.
2. To place "Contacts" either under "surveillance" or "observation."

"Observation" means isolation of travellers either on board ship or in a Sanitary station before they obtain free pratique. The period of observation shall not exceed five days, dating from the arrival of the ship. "Surveillance" means that travellers are not isolated: they receive free pratique immediately, but the Authorities of the several places whither they are bound, are informed of their coming, and they are subjected to medical examination by the Authority of the place, with a view to ascertaining their state of health.

If the Port Sanitary Authority decide upon "observation" they may, if they see fit, impose "surveillance" for a period not exceeding five days, in addition to "observation."

It rests with the Port Sanitary Authority to decide which one of these procedures shall be adopted, or whether it will be advisable to impose both, having regard to the date of the last case of sickness, the condition of the ship, and the local possibilities.

3. *Disinfection* of such soiled linen, wearing apparel and articles belonging to the crew and passengers, as are in the opinion of the Sanitary Authority, infected.

4. Such parts of the ship as have been *occupied* by persons ill from Plague, or that in the opinion of the Sanitary Authority, are infected, *must* be disinfected.

5. The rats on board *must* be destroyed, either before or after discharge of cargo, as quickly as possible and, in any case, within a maximum period of 48 hours, and so as to avoid damage to merchandise and the ship's plating and engines. In case of ships in ballast, this process must be carried out as soon as possible and before taking cargo.

Such are the precautions which must now be adopted in the case of "infected" ships. By an "infected ship" is meant one on which there is actually plague on board, or upon which there has been one or more cases of *human* plague within the previous seven days.

The procedures *which must be adopted* in the case of an "infected ship" are thus as follows:

1. Isolation of the sick.
2. "Observation" or "Surveillance" of "Contacts" or both.
3. Disinfection of (a) articles likely to retain infection.
(b) parts of the ship likely to be infected.
4. Destruction of rats.

II.

On the other hand in the case of a "suspected" ship, that is to say, a vessel upon which there have been cases or a case of plague, either at the time of departure from port, or during the voyage, but *no fresh case within the previous seven days*, the procedure which *must be adopted* is as follows:—

1. Disinfection of (a) Articles likely to retain infection.
(b) Parts of the ship likely to be infected.

In addition the Port Sanitary Authority *may* :

1. Subject the crew or passengers to “Surveillance,” the duration which, dating from the arrival of the ship, shall not exceed five days.
2. *May*, and this step is “recommended,” take steps for the destruction of rats, either before or after discharge of cargo, as quickly as possible and in any case within a maximum period of 48 hours, and so as to avoid damage to merchandise, or the ship’s plating and engines. This simply means that the question of rat destruction is left to the discretion of the Port Sanitary Authority.

III.

Finally, in the case of a “healthy” ship, which, so far as plague is concerned, means a vessel which has come from an infected port, but on which there has been no death from nor case of plague, either before departure, during the voyage, or on arrival, the Port Sanitary Authority *may*

1. Order the disinfection, in exceptional instances, where the local Authority deem it to be advisable for special reasons, which are at the discretion of the local Authority, of soiled linen, wearing apparel and other articles belonging to the crew or passengers.

2. Subject the crew and passengers to “Surveillance” for a period not exceeding five days from the date on which the ship *left the infected port*. The crew during the same period may be prevented leaving the ship except on duty.

3. Subject ships to a process intended to secure the destruction of rats, with the usual provisions, as to damage to cargo, and ship’s plating and engines.

It is to be observed that in all the above instances the question of rat destruction is independent of any actual disease amongst rats. In the first instance, namely, on an infected ship, the rats *must* be destroyed. Hence, from the particular point of view, it is immaterial whether the rats are infected or not.

In the case of “suspected” ships the destruction of rats is not compulsory, nor is it compulsory on “healthy” ships, always recollecting that the terms “suspected” and “healthy” ships, apply to the human beings on board and not to the rats.

Should, however, the rats on a ship, “healthy” so far as the appearance of the disease amongst human beings is concerned, be shown by bacteriological examination to be infected with plague, or if there has been an *unusual mortality* amongst those rodents, the procedures to be adopted are as follows:

I

SHIPS WITH *RATS INFECTED WITH PLAGUE*.

(1) Medical inspection.

(2.) The rats *must be destroyed* either before or after discharge of cargo, as quickly as possible, and in any case within a maximum period of 48 hours, with the usual provisions as to damage.

(3.) Such parts of the ship, and such articles as the local Sanitary Authority regards as infected, *must* be disinfected.

(4.) The crew and passengers *may* be subjected to *surveillance* during a period of not more than five days reckoned from the date of arrival, save in exceptional instances, in which the Sanitary Authority may prolong the surveillance up to not more than ten days.

II.

SHIPS ON WHICH *UNUSUAL MORTALITY AMONG RATS* HAS BEEN OBSERVED:

(1.) Medical inspection.

(2.) The rats shall be examined for plague, so far and as quickly as possible.

(3.) *If it be considered necessary* to destroy the rats (a decision which must be based on the results of the bacteriological examination), the destruction shall take place subject to the usual provisions as to time and possibilities of damage to cargo, plating, and engines.

(4.) Until all suspicion has been removed, the passengers and crew *may* be subjected to "surveillance" during a period not exceeding five days from the date of arrival, save in exceptional instances where the Sanitary Authority may prolong the period up to ten days.

So far as these provisions are concerned, any Port Sanitary Authority to which they are likely to apply, may be considered to be possessed of means of medical inspection, of isolation of the sick, of means of securing disinfection of articles of clothing, etc., and of procuring the disinfection of such parts of the ship as may retain infection from cases of human plague. As to "observation" and "surveillance" these are matters which every Port Sanitary Authority can put in force without further preparation.

When, however, we come to the consideration of the question of rat destruction, we are confronted with a totally different state of affairs. I must again refer to the fact that the Conference indicates two conditions where the destruction of rats is to be considered *compulsory*. They are:

(1.) When the ship is "infected" with plague amongst crew or passengers, whether the rats are infected or not.

(2.) Where the rats are infected with the plague, whether the crew and passengers are or not, also infected.

If we disregard altogether the instances where the Port Sanitary Authorities *may* proceed to measures of rat destruction, let me ask the question: How many Port Sanitary Authorities in this kingdom are prepared to-day to deal *efficiently* with this problem in those cases where they *must* act?

It will, no doubt, be asserted that the number of instances where such a process is required is so small that the danger may be overrated. In answer to this I would merely point to the fact that plague has gradually extended during previous years until now it may be said to have infected every trading community under the sun. In this country the experience of Glasgow is not forgotten. We have seen the ravages of this disease in Marseilles, Egypt, South Africa, South America, etc.,

to mention only a few. The case of Sydney is one which affords almost absolute evidence of the influence of rat importation. When we further consider, the loss of life and the enormous monetary loss sustained, not only in the actual amount of money spent, in combating the spread of this disease, but also in the dislocation of commerce which invariably accompanies the appearance of the disease in a community, we can understand the paramount importance of sparing no expense in keeping the disease from our own ports

Let us, therefore, enquire what means are at present in existence for dealing with this matter.

There are, at the present time, five principal agents in use for the purpose of rat destruction. These are :

- (1.) The use of Carbonic Oxide Gas.
- (2.) The use of Carbonic Acid Gas.
- (3.) The use of Sulphur Dioxide, generated by the combustion in the open air.
- (4.) The Clayton system of Sulphur fumigation.
- (5.) The use of compressed Sulphur Dioxide.

In deciding which of these processes is the most worthy of general adoption it is necessary, in the first instance, to obtain a clear conception as to the nature of the services which the agent ought to render, and then investigate the action of each of the above, and endeavour to discover, in the light of all the evidence, how far each fulfills the requirements of the ideal.

It appears to me that the agent used must be :

(1.) An efficient disinfectant. By this I mean that it must be able to destroy, within a reasonable time, the organisms which are the prime cause of the disease, in any position where the organism may chance to be present.

- (2.) It must be absolutely fatal to all rats and mice.
- (3.) It must be fatal to the fleas which infest rats and mice.
- (4.) It must be capable of use at a reasonable cost.
- (5.) Its action must be sufficiently rapid to cause no unreasonable delay to the ship.
- (6.) It must have no injurious effect upon cargo.

- (7.) It must have no injurious effect upon the ship's plating or engines.

For convenience it will be well to consider the Carbonic Oxide and Carbonic Acid processes first.

- (1.) The Carbonic Oxide process. This process is the one used at Hamburg. The advantages claimed for it are as follows:
- (1.) It is most efficient as a rat destroyer.
 - (2.) Its use is not expensive.
 - (3.) It is rapid in action.
 - (4.) It has no injurious effects upon cargo.
 - (5.) It has no injurious effects upon ship's plating or engines.

Its disadvantages are:

- (1.) It is in no sense a disinfectant, hence it has no effect upon the prime cause of the disease.
- (2.) It is not fatal to fleas, which are probably the principal agents whereby the disease is spread from rat to rat, and possibly from rats to man, though this is by no means proved.
- (3.) Its use is attended by considerable risk of explosion. Carbonic Oxide in certain proportions forms an explosive mixture with air.
- (4.) It is a deadly and insidious poison, revealing its presence by no signs appreciable to the senses, and hence its use is fraught with grave risk to human beings.

It is thus clear that this process falls far short of the ideal. Its lack of disinfecting power means that if disinfection is to be arrived at all, as well as rat destruction, some other process must be used for this purpose *in addition*. For example: if the rats on board are infected with plague, and are destroyed by this process, those parts of the ship with which the infected rats have come in contact will be rendered infected, and hence, in order to disinfect these portions, some disinfectant will require to be used in addition. Two processes thus become necessary instead of one.

2. With regard to the Carbonic Acid process as used at Marseilles, the following advantages are claimed:

1. Efficiency as a rat destroyer.
2. Rapidity of action.
3. Absence of injurious effects upon cargo.
4. Absence of injurious effect upon ships' plating and engines.
5. The gas being a heavy one distributes itself throughout large spaces simply by its own weight.
6. It is much less dangerous to man than Carbonic Oxide, as it causes immediate symptoms of asphyxiation, and its presence can be detected by its power of extinguishing lights.

The disadvantages are :

1. It is in no sense a disinfectant.
2. It cannot be considered as a reliable agent for the destruction of fleas, etc.
3. An enormous amount is required to ensure the destruction of rats and mice—indeed probably about 25 per cent. is necessary. Hence the expense of the process is very great.

It is thus clear that this process, like Carbonic Oxide, falls short of the standard of requirement in two most important particulars, namely, its inefficiency as a disinfectant and its want of reliability as an agent for the destruction of fleas. Hence it follows that some other agent must be used in addition in those instances where a ship is "infected," or where there is disease amongst the rats.

We therefore arrive at the following proposition:—"The Carbonic processes do not fulfill all the requirements of the case where a process of rat destruction, combined with a process of disinfection is absolutely required, namely, where a ship is "infected," or where plague has been discovered amongst rats." Hence, the one or the other of these agents is contra-indicated in those instances which, far above all others, require the use of an agent which will at once destroy the rats, the fleas which infest the rats, and at the same time secure the disinfection of the ship.

Turning therefore to the Sulphur processes we find that there are at the present time three procedures which require consideration.

These are :

1. The generation of S.O. 2 by the combustion of sulphur in the open air.

2. The use of liquid S O. 2, which is of the same composition as the S.O. 2, attained by burning the sulphur in the open air.

3. The Clayton process.

Let us examine these processes seriatim.

1. S.O. 2, generated by the combustion of sulphur in the open air. The advantages of this method are :

1. It is efficient as a rat destroyer.

2. It is a disinfectant of a certain amount of power. It is to be recollected however, that the amount of S.O. 2, which can be produced by this process is limited by the fact that the gas itself inhibits combustion when it is present to the extent of 4 per cent. of the atmosphere. Hence the gas puts an end to its own formation at an early period of its production.

3. It is fatal to fleas, etc.

4. It is not costly.

The disadvantages are :

1. The gas cannot be used on loaded ships without first removing the cargo in the square of the hatch—a process which is a costly one.

2. There is a distinct risk of fire, not only in such cases, but also even when the ship is empty.

3. There is legitimate doubt as to whether *all* the rats can be destroyed by this means.

4. There is the same liability to damage to cargo, ships plating and engines, which is present with all sulphur agents.

5. The process is a slow one.

6. The S.O. 2 is absorbed in a varying degree by various articles of cargo, and hence the amount available for disinfection is correspondingly diminished.

In conclusion, the evidence points strongly to the fact that whilst this process may be adopted on ships without cargo, it cannot with safety and efficiency be adopted on loaded ships. The prospect of securing even and free distribution of the gas in the holds full of cargo is remote.

II. S.O. 2 poured into the holds from cylinders of the liquified gas. The advantages of this process are :

1. Efficiency as a disinfectant.
2. Efficiency as a destroyer of fleas, etc.
3. Efficiency as a destroyer of rats.
4. Cheapness. The cost is not great.
5. Rapidity of action.
6. No capital outlay is required.

The disadvantages are :

1. Risk of damage to cargo, ships' plating, and engines.
2. The difficulty of use in the case of loaded ships. It would be a matter of great difficulty to secure proper diffusion of gas in such cases. Some portions of the hold would receive too much whilst other parts would not receive enough. Hence there would arise a difficulty in securing complete destruction of rats, and a probability that portions of the ship and cargo would escape proper disinfection.
3. The S.O. 2 is absorbed in varying degree by various articles of cargo, and hence the amount available for disinfection is correspondingly diminished.

It is indeed very doubtful if this procedure could be followed with advantage on board loaded ships.

"There can be no doubt, however, that the process is one which, on the score of cheapness, convenience, absence of heavy initial outlay, and general efficiency, is well worthy of a more extended trial."—*(Report by Drs. Haldane and Wade.)*

III. Finally, let us consider the Clayton process. The essential details of this procedure are :

1. The gas is produced by the combustion of sulphur in a chamber of suitable size, the necessary oxygen being continually supplied through a pipe of sufficient size, which is let into the chamber, the other end being introduced into the highest point of the hold which is being treated.

The resulting gas is of somewhat uncertain composition. It is, however, certain that it contains ;

1. A high percentage of S.O. 2.
2. A small, but constant percentage of S.O. 3.

3. It is asserted other oxides of sulphur are present. These, however, for all practical purposes, may be neglected, and the gas considered as a mixture of the above oxides, namely, S.O._2 and S.O._3 . It is indeed questionable if any other oxides are really present.

The gas thus produced is driven down into the hold after being cooled, by means of a blower which propels the gas through a tube of a sufficient length to reach the bottom of the hold. It thus arises that this gas, which is not only much heavier than air and thereby all the more easily replaces the air in the hold, but it is also driven into the hold under very considerable pressure, quickly replaces the air in the hold, and thereby a percentage of S.O._2 can be attained, which no other sulphur process at present in use can approach. It is quite easy to fill a hold with 10, 12, or 15 per cent. of this gas, and further, this percentage can easily be maintained.

Let us examine the advantages of the process :

1. It is a powerful disinfectant. The experiments of Calmette, Wade, Savage and others, clearly and emphatically prove this contention.
2. It is an efficient agent for the destruction of rats if proper care be taken.
3. It is reliable as a destroyer of fleas, etc.
4. It is convenient in use.
5. It is rapid in action.
6. It can be used on loaded ships with facility.
7. There is no danger of fire.
8. And no danger of poisoning human beings.

The disadvantages are :

1. The initial expense is considerable.
2. The cost of the process itself considerably exceeds that of the other sulphur processes.
3. There is much evidence to show that certain kinds of cargo receive permanent damage from its use.
4. In common with all sulphur processes the Clayton system labours under the great disadvantage that a varying amount of the sulphur gas is absorbed and rendered useless so far as disinfection and

rat destruction are concerned, by various kinds of cargo. Dr. Wade points out that a bale of wool absorbs at least ten times its volume of the gas, and a bale of jute at least four times its volume; cotton on the other hand does not absorb the gas.

The practical meaning of this is that a hold filled with wool will require at least ten times as much of the gas as a hold filled with cotton if the same percentage of gas is required to be present in the hold in each case. Put it in another way: at least two and a half times as much gas would be required to disinfect one hold loaded with wool as would suffice for a whole vessel loaded with cotton, allowing the ship to have four holds of equal size.

The following summary from the report of Drs. Haldane and Wade is inserted in order to show the results of their enquiry as to the action of sulphur agents.

SUMMARY.

“The results of the enquiry into the processes of disinfection by sulphur dioxide may be summarised as under:

1. All rats and insects in a ship would be destroyed in less than two hours by the uniform diffusion of 0.5 per cent. of sulphur dioxide. This condition is easily realised in the case of cabins and empty holds, but owing to the rapid absorption of sulphur dioxide by most articles of cargo cannot as a rule be realised in a loaded hold.

2. Pathogenic bacteria, such as those of plague and cholera, require a somewhat larger percentage of sulphur dioxide, but under the same conditions and with the same limitations, plague germs would be destroyed in six hours at most by a gas containing two per cent. of sulphur dioxide. The typhoid bacillus is considerably more resistant than that of plague, but would certainly be destroyed in 24 hours under these conditions. Anthrax spores do not appear to be affected by sulphur dioxide.

3. Most articles of cargo absorb relatively large volumes of sulphur dioxide which they give up again more or less readily when exposed to air. A bale of wool absorbs at least ten times its volume of the undiluted gas, and a bale of jute about four times its volume, but a bale of

cotton probably absorbs none at all. Flour absorbs about four and a half times its volume of undiluted sulphur dioxide, a small fraction of which it retains very tenaciously.

The non-poisonous constituents of "Clayton Gas" (nitrogen and oxygen) penetrates with great rapidity into the interior of the bales, but owing to absorption the sulphur dioxide does not penetrate in any reasonable time.

4. Dry textile fabrics are not as a rule appreciably affected by sulphur dioxide, but where exposed to the direct action of "Clayton Gas" are injured by free sulphuric acid, formed from the sulphur trioxide. They may be completely shielded from the action of this acid by covering with paper.

Metals are not affected by dry sulphur dioxide, but are tarnished by the sulphuric acid of "Clayton Gas"; the tarnishing is negligible if the metal is covered with paper or with a thin coating of whitening.

Most seeds and grain absorb sulphur dioxide to a considerable extent, but do not appear to be appreciably affected by it until after the lapse of some months.

Most dry food stuffs absorb sulphur dioxide, especially when in a state of powder, and in many cases retain enough of the gas, in combination as a sulphite, to impair the flavour. The amount thus retained in flour is sufficient to sterilise yeast. Hence such flour is useless for bread baking.

Moist food stuffs such as fruit, vegetables, and meat, are uneatable after exposure to sulphur dioxide.

It is now possible to survey the results of our enquiry bearing in mind :

1. The requirements of an ideal agent for the purpose,
2. The requirements of the Paris Convention,
3. The ship is presumed to be loaded with an ordinary general cargo.

Let us first examine the case where it is required to *disinfect the ship and secure* the destruction of rats and fleas.

It is to be noted that disinfection of holds and cargo is a necessary corollary of the rats being infected. It is impossible to conceive that infected rats, any more than infected human beings, should not infect the parts of the ship with which they have come in contact. Hence it follows that a process of compulsory rat destruction involves a process of disinfection in order to disinfect such cargo and parts of the ship as have been infected by the diseased rats. To destroy the *rats alone* in such a case would obviously be insufficient, as the Convention clearly states that "such parts of the ship as the Authority regards as being infected must be disinfected." It is impossible, as I have already said, to think of infected rats apart from an infected ship and cargo.

A combined process of rat destruction and disinfection is thus essential.

The carbon processes are ruled out of court because, whilst they secure the destruction of rats, they *do not* disinfect the ship and *do not* destroy the fleas. If a carbon process is used in these cases it becomes necessary to use a sulphur process in order to secure disinfection.

It has already been pointed out that all the sulphur processes entail the possibility of damage to cargo and tarnishing of metal, including ships plating and engines.

To take the latter first, the question of ships plating may be disregarded because the amount of damage to plating is so infinitesimal as to be negligible.

With regard to engines any damage may be avoided by the use of a little whitening. I therefore consider that the only question worthy of practical consideration is the question of damage to cargo.

The Convention clearly states that rat destruction and disinfection shall be carried out so as "not to damage cargo."

If, therefore, disinfection *must* be carried out, and if there be no disinfecting process free from the liability to damage cargo, then it follows, if the terms of the Convention are to be adhered to, that the process which causes least damage is the one which ought to be adopted, since the importance of disinfection *must* override all other considerations.

I consider that the method of producing S.O. 2 by the combustion of sulphur in the open air is not one to be recommended.

1. Because it has the disadvantages of all sulphur processes, viz., liability to damage certain classes of cargo, and diminution of value owing to the absorption of S.O. 2 by various classes of goods.

2. Its use is impracticable on loaded ships, the very cases where a process of disinfection is required.

3. The risk of fire is too great.

4. The amount of S.O. 2 per 1000 cubic feet is limited by the fact that it is impossible to reach more than 4 per cent. of the gas, as combustion ceases when S.O. 2 is present to that extent in the atmosphere. This amount is, however, sufficient for thorough disinfection if the cargo be exposed for 24 hours to the action of the gas.

We are, therefore, limited to the use of either compressed S.O. 2 or the Clayton Process.

For convenience of use, easy adoption on loaded ships, efficiency as a rat destroyer and disinfectant, there is no doubt that the Clayton Process has very strong claims for consideration. Its great disadvantage is the liability to damage to cargo, due in large measure to the presence of S.O. 3. If *all* vessels, healthy or otherwise, coming to our ports from any infected port were to be treated for the purpose of rat destruction, a process which can in no sense be considered as a rational or justifiable procedure, then indeed the question of damage to cargo, which would obviously in such cases be of the most diverse kinds, would render the propriety of the adoption of such a process, very doubtful. As however such a proceeding would be a direct violation of the provisions of the convention, to say nothing of its commercial impracticability, it need not be considered, and thus it will only be necessary to deal with cases of actual human or rat infection. In such cases I repeat disinfection *must* be carried out in accordance with the requirements of the convention.

The question therefore comes to be this, whether if we are limited to the use of either compressed S.O. 2. or the Clayton process, the advantages of the Clayton process, counterbalance its alleged disadvantages.

In answering this question I quote the following extracts from the Report of Drs. Haldane and Wade.

“In cases of known infection of vessels the treatment by Carbonic Oxide would doubtless need to be followed by a separate disinfection process. The question of a certain amount of damage by the Sulphur process on vessels *actually infected* with plague, of which there are likely to be very few, is of no great importance, particularly as disinfection will be needed in any case. In view of all the circumstances we think, therefore, that a sulphur dioxide process will be most generally useful.”

“Provided the necessary apparatus could be supplied and worked at a reasonable cost, the Clayton Process, in instances where it is desired to destroy rats on board before discharge of cargo, would probably be more useful in large English ports than any of the others discussed. Nevertheless there still remains great doubt as to whether the gas will penetrate cargoes sufficiently rapidly to kill all the rats within a reasonable number of hours, and corresponding doubt as to the disinfecting action of the gas in the interior of a hold full of cargo. The Dunkirk observations show that in any case each hold will require several hours treatment at least.”

“An alternative to the Clayton process is afforded by the use of liquified sulphurous acid contained in cylinders. This method is, we think, worthy of further trial, a sufficient amount of the gas being used and proper arrangements being made for its diffusion.”

“The use of liquified sulphurous acid has evident advantages on the score of convenience, safety, and absence of heavy capital outlay over other processes.” “Whether it can be used in such a way as to be effective in holds full of cargo is still doubtful, but there is no doubt that it would be excellent in empty spaces, and could be used at a moderate cost.”

It is to be observed that there is still reasonable room for doubt as to the possibility of use of liquid S.O. 2. on loaded ships. When we turn to the provisions of the Paris Convention we are told that the rats must be destroyed within a maximum period of 48 hours from the arrival of the ship. This means that any process must

be commenced some time *prior*, say 24 hours, to the end of the time allowed, so that if the ship is to be emptied prior to treatment there remains only an available period of 24 hours at the very most. This is far too short a time for a full sized cargo vessel, which will carry at least 6000 tons. Hence if the terms of the Convention are to be carried out we must adopt that process which is most available on loaded ships. The report of Drs. Haldane & Wade gives the preference to the Clayton system as being the most generally reliable and available process for the particular purpose.

It seems to me that the requirements of the Convention and the action of such agents as are in our possession are incompatible. The Convention requires rat destruction and disinfection without damage to cargo. Our carbon agents secure rat destruction, but they neither destroy fleas nor disinfect places nor goods which may have become infected by rats. Our sulphur agents, on the other hand, destroy rats and fleas, and disinfect ships and cargo, but are apt to damage certain kinds of cargo, and hence in those particular instances are inadmissible according to the requirements of the Convention.

In the face of the facts that it has never been shown that plague is spread by cargo, and that Article 11 of the Convention clearly states that "no article of merchandise is in itself capable of conveying plague," and that "merchandise becomes dangerous only when contaminated by plague products," the question naturally arises to what extent do plague infected rats really infect cargo? There is no doubt whatever that they do infect a certain, probably a very small, proportion of the cargo, and that it is essential for the public safety that that portion of cargo should be so treated as to destroy the chance of infection.

Some light is shed on this matter by Article 12 of the Convention, which states that "only such merchandise and things as the local Sanitary Authority considers infected may be subjected to disinfection."

If, therefore, an unknown but probably a small proportion of a cargo, perishable so far as the action of a disinfectant is concerned, is found to be infected, are we justified in adopting a process which may damage the whole cargo?

Drs. Haldane and Wade answer this question in the affirmative.

I do not consider that their view can be adopted without considerable reservation.

Whilst in full concurrence with the view that such portions of the cargo as are infected must be disinfected, and that the question is purely a secondary one, so far as that particular portion of cargo is concerned. I consider that wholesale disinfection in those cases where damage to cargo is likely to arise, is a procedure which can rarely be justified.

As in some degree bearing upon this point I would quote Article 17 of the Convention, which states that "provided always that if merchandise, which has come by sea and is either not packed or imperfectly packed, has become infected during the voyage by rats ascertained to have plague, and *if such merchandise cannot be disinfected*, the *destruction of germs may be* secured by storing the merchandise during a period not exceeding two weeks. It is to be understood that the application of this measure shall not delay the ship in any way, nor give rise to extra expense by reason of deficient storage accommodation at any port."

The only question involved in the provisions of this Article is the length of time during which the merchandise must be stored in order to secure the end in view. Two weeks is too short a period for the particular purpose.

I have quoted this section to show that in the opinion of the Conference, destruction of the germs of plague can be secured by the simple process of storing the goods infected for such a time as will permit of the natural death of the germs of the disease.

The procedure which one would be inclined to follow in all ordinary cases would be the last recommended by Drs. Haldane and Wade. It is precisely the opinion which I have formed after analysis of all the facts of the case.

The procedure is as follows :

“Another method would be to treat the accessible portions of a ship with sulphurous acid gas in some form before the discharge of cargo ; to unload the cargo with all practical precautions to prevent rats escaping from the holds and getting on shore ; and then to treat the empty holds with sulphurous acid so as to destroy all rats and insects. This course, while ostensibly aiming at the ideal in less degree than do procedures applied before discharge of cargo, has the important administrative advantage of being practicable at every port, and of being specially suitable in the case of cargoes likely to be damaged by sulphurous acid, and it may well be that this plan will be found to give as satisfactory results as more ambitious methods not yet free from difficulty in their application, nor from doubt as to their efficiency.”

As to the Sulphur process to be used, the choice seems to me to lie between the Clayton process and compressed S.O. 2. The latter is the cheaper of the two, and though not so convenient in use, and though there are difficulties in securing proper diffusion, still these difficulties could be overcome.

If the question of expense can be neglected, then the Clayton process seems to me the one which ought to be preferred. There is no doubt as to its efficiency under fair conditions. After all the extra expense is not so very great.

In concluding this resume, I would state that in those cases where the cargo of an “infected” ship, either in the case of human beings or rats, was of such a character as not to be damaged by sulphur gas, then the ship can be disinfected by either the Clayton system (for preference) or Compressed S.O. 2. *before* discharge of the cargo.

The following propositions suggest themselves in reference to the action of the various agents under consideration.

1. There is no agent at present in use which fulfils the *requirements of the ideal* as at once a rat destroyer, a disinfectant, a destroyer of fleas and without injurious effect upon *all* kinds of merchandise. The Carbon processes fail because they do not disinfect, and are not reliable agents for the destruction of fleas ; the Sulphur processes fail because of their liability to damage *certain kinds* of cargo.

2. None of the processes fulfil the *requirements of the International Conference*, the Carbon processes because they do not disinfect, nor do they destroy fleas, and the Sulphur processes on account of their liability to damage *certain kinds* of cargo.

REGULATIONS OF THE CONVENTION REGARDING CHOLERA.

ARTICLE 20.

A ship "infected" with cholera is defined as a vessel on which "there is cholera on board, or if there have been one or more cases on board within seven days."

A ship shall be regarded as "suspected" "if there have been cases of cholera on board at the time of departure or during the voyage, but no fresh cases within seven days."

A ship shall be regarded as "healthy," notwithstanding its having come from an infected port, "if there has been no death from nor case of cholera on board either before departure or during the voyage or on arrival."

ARTICLE 26.

In the case of cholera infected ships *shall* undergo the following measures :

1. Medical inspection.
2. The sick *shall* be immediately disembarked and isolated.
3. The other persons *must* also be disembarked *if possible*, and either be kept under "observation" or subjected to "surveillance" during a period which shall vary with the health conditions of the ship and the date of the last case, but which shall not exceed five days reckoned from the arrival of the ship.
4. Such soiled linen, wearing apparel and articles belonging to the crew and passengers as are, in the opinion of the Sanitary Authority of the port, infected, *shall* be disinfected.

5. The parts of a ship that have been occupied by persons ill with cholera, or that the Sanitary Authority regard as infected, *shall* be disinfected.

6. The bilge water shall be disinfected and pumped out.

The Sanitary Authority *may* order that a supply of wholesome drinking water shall be substituted for that stored on board.

Casting human excreta, or allowing them to pass, without preliminary disinfection into the waters of the port *may* be prohibited.

ARTICLE 27.

In the case of cholera suspected ships *shall* undergo :

1. Medical inspection.
2. Such soiled linen, wearing apparel and articles belonging to the crew and passengers as are, in the opinion of the Sanitary Authority of the port, infected, shall be disinfected.
3. The parts of a ship that have been occupied by persons ill with cholera, or the Sanitary Authority regard as infected, shall be disinfected.
4. The bilge water shall be disinfected and pumped out.

The crew and passengers *may* be subjected to "surveillance" during a period which must not exceed five days, reckoned from the arrival of the ship. It is *recommended* that the crew be prevented, during the same period, from leaving the ship except on duty.

ARTICLE 28.

In the case of cholera "healthy" ships shall be given free pratique immediately whatever their bill of health may be.

The only measures that the Authority of the port of arrival *may* prescribe as regards these ships are the following :

1. Medical inspection.
2. Such soiled linen, wearing apparel and articles belonging to the crew and passengers as are, in the opinion of the Sanitary Authority of the port, infected, shall be disinfected.

3. Bilge water, if prescribed by the Sanitary Authority, shall be disinfected and pumped out.

The crew and passengers *may* be subjected to "surveillance" in respect of their state of health during a period which must not exceed five days reckoned from the date on which the ship left the infected port. It is *recommended* that the crew be prevented during the same period from leaving the ship except on duty.

GENERAL.

The following articles are inserted on account of their important bearing on the prevention of both plague and cholera.

ARTICLE 30.

"Special measures may be prescribed as regards ships that are overcrowded, and more especially as regards emigrant ships, or any other ship in an insanitary condition."

ARTICLE 31.

"Ships refusing to submit to measures prescribed by a port authority, in virtue of the provisions of this Convention, shall be at liberty to put out to sea. Such ships may be permitted to land goods after the following necessary precautions have been taken, viz:

1. Isolation of the ship, crew, and passengers.
2. In the case of plague, request for information as to whether there has been any unusual mortality among rats on board.
3. In the case of cholera, disinfection and evacuation of the bilge-water and the substitution of wholesome drinking-water for that stored on board.

Such ships may also be authorised to disembark passengers at their request, on the condition that such passengers submit to the measures prescribed by the local authority."

ARTICLE 32.

"Ships from an infected place, that have been disinfected and have undergone adequate sanitary measures, shall not, on their arrival in another port, be subjected to these measures a second time if

no case has occurred since the disinfection was performed, and if they have not called at an infected port. A ship which has merely disembarked passengers and their baggage, or mails, without having been in communication with the shore shall not be regarded as having called at the port."

ARTICLE 33.

"Passengers arriving by an infected ship are entitled to exact from the Sanitary Authority of the port a certificate showing the date of their arrival and the measures taken as regards themselves and their baggage."

ARTICLE 34.

"Coasting traffic shall be dealt with by special regulations to be agreed upon by the countries concerned."

ARTICLE 35.

"Without prejudice to the right of governments to agree to establish Sanitary stations in common, every country must provide at least one port on each of its seaboards with an organisation and an equipment sufficient for the reception of a ship, whatever the health conditions may be."

"It is recommended that when a healthy ship from an infected port arrives at a large seaport such ship should not be sent away to another port with a view to the carrying out of the sanitary measures 'prescribed'."

"In every country the ports open to arrivals from ports infected with plague or cholera must be so equipped that healthy ships can there undergo the prescribed measures upon their arrival, and be not sent to another port for the purpose. Governments shall make known what ports in their country are open to arrivals from ports infected with plague or cholera."

ARTICLE 36.

It is recommended that there be provided in large seaports :

A. A properly organised port medical service and permanent medical supervision of the health conditions of crews and of the population of the port,

B. Suitable accommodation for the isolation of the sick and for keeping suspected persons under observation.

C. Bacteriological laboratories and the buildings and plant necessary for efficient disinfection.

D. A supply of drinking water of quality above suspicion at the disposal of the port, and a system of scavenging that offers every possible guarantee for the removal of excrement and refuse."

RECOMMENDATIONS REGARDING YELLOW FEVER.

Article 182 states "The countries concerned are recommended to modify their Sanitary regulations in such fashion as to bring them into harmony with the present scientific data as to the manner in which yellow fever is transmitted and, in particular, as to the part played by mosquitoes in carrying the germs of the disease."

THE SANITARY CONDITION OF SHIPS.

The number of vessels inspected is the greatest since the establishment of the Authority.

The total number of inspections was 3,436. In this number are included 815 re-visits, so that the total number of vessels inspected was 2,621. The number inspected in the previous year was 2,385.

Tables I., II., III., IV., V. and VI. sufficiently explain themselves.

Table VIII. shows that, out of 2,621 vessels inspected, defective or insanitary conditions were found on 1,241, or 47·35%. This proportion is higher than in the previous year, when the percentage was 38·4%.

The figures thus given, would, without analysis, convey a very erroneous impression of the actual state of affairs. It is therefore necessary, in order to arrive at a sound and clear appreciation of the facts, to classify the various units of which the total numbers are composed. For this purpose I have compiled Table IX. In this table the shipping dealt with is divided into three classes, viz.: steamships, sailing ships, and barges. The essential fact disclosed by this table is this, that steamships do not exhibit anything like the percentage of defects that occur on sailing vessels and barges. Indeed, the percentage of defects discovered on the latter classes is, approximately, double that on steamships.

Assuming therefore that steamships exhibit considerably fewer defects than sailing vessels and barges, let us enquire what are the circumstances which determine the liability of the various types of vessels to defective or insanitary conditions.

It seems to me that the *size* of the vessel and the *age* throw a good deal of light on this matter.

Table X. deals with the question of size from the point of view of registered tonnage. I find that sail is best classified, at least so far as the type of vessels using the Port of Manchester is concerned, into those under and those over 250 tons. The result shows that the smaller class of vessels are the worst offenders.

So far as barges are concerned all the vessels examined were under 150 tons, so that the question of tonnage is a secondary matter in this particular instance. The incidence of defective or insanitary conditions, however, approximates closely to that of the smaller class of sailing vessels.

In the case of steamships the influence of size is evident at once. We find that the figures in Table XI. show, clearly and definitely, the truth of the proposition, that the smaller the vessel the greater is the liability to defective or insanitary conditions. We find that the vessels classified as between 1 and 250 tons constitute 35.4% of the total number of steamships inspected, but that this class provides more than one half of the total number of steamships defective.

This result merely corroborates previous experience.

The next point to which one directed attention was the influence of age. It has not been possible to verify the age of every vessel inspected as the verbal statement of the master or officer is not accepted as sufficiently accurate for statistical purposes.

Tables I., II. and III., merely show the numbers of the units which are being dealt with, and refer these units to their proper class.

In Table IV. the various units are classified according to the age-periods adopted in Lloyds Register.

Taking sail in the first instance I fail to discover any evidence in favour of the theory that defective conditions occur on old vessels only. In every age-period save one, the numbers showing defective conditions are very close to the average. In the case of sail between 10 and 5 years of age, although the figures show the average of defects, yet they are of no value as the numbers are so small. Precisely the same remark applies to vessels under 5 years of age.

So far as sailing vessels are concerned, neither a prolonged experience, nor the actual test of figures, lend any support to the idea that new ships are exempt from defective conditions.

Turning to the question of steamships, we find that on the whole there is some evidence that age has some influence on the matter. The numbers in all classes, save the very oldest, which will therefore be

neglected, are sufficient to give a fairly accurate conception of the influence of age in this relation. We find that the average percentage of deficiency for all ages is 38.6%. For all practical purposes the age periods of 40-20 and 10-5 show this percentage of deficiency. We find, further, that the age period of 20-10 exhibits a higher percentage of defects than the 40-20 age period. Lastly, we find that the vessels under 5 years of age are the most numerous class, and, consequently, the value of the units of which it is composed is the greatest. The net results of these advantageous circumstances is, that the percentage of deficiency is $6\frac{1}{2}$ per cent. below the average.

Yet the 40-20 period is only 4 per cent. over the average. If age had so much to do with it I consider that the old vessels would be at least as much over the average as the new vessels are under.

The influence of age upon the sanitary condition of steamships, may readily be much overrated.

The sanitary condition of a vessel depends entirely upon the way in which the vessel has been constructed in the first instance and upon the way in which it has been kept since being built. Once constructed properly, a vessel will keep in a perfectly sound sanitary condition for years if only it be properly looked after.

The true causes of insanitary conditions on board ship are faulty initial construction, the normal results of wear and tear, and last, but not by any means least, neglect.

The larger type of steamships and sailing vessels are, particularly those built within recent years, constructed in such a manner as in many respects to go beyond the requirements of the board of trade. There are not a few vessels using the Port of Manchester at the present time which would be difficult to improve upon. Some of these are quite recent vessels. There are others of an older type which are so thoroughly well kept that it is never necessary for the Port Sanitary Authority to make any complaint respecting them.

Even on large vessels, however, the inevitable effects of wear and tear show themselves in the course of time, and various defects exhibit themselves. I always find that in the case of the class of vessels under consideration, a word to the master of the vessel is sufficient to ensure the remedying of the condition.

In the case however of small vessels, either steam or sail, the matter is somewhat different.

Small vessels feel the effects of wear and tear more than the larger types. They are of more tender construction than large vessels and are more liable to damage from bad weather, etc. Hence there is a greater liability for things to go wrong with them.

Again, in small vessels, the crew space *must* inevitably be on the small side. By this I mean that small vessels will usually exhibit a fore-castle of just sufficient size to accommodate the necessary crew. Such must be the case, as it is not to be expected that more space will be deducted from the cargo space than can possibly be avoided. Bearing this in mind, what do we find ?

There is a class of small vessel, which, sufficiently well constructed in respect of cubic space, floor area, lighting, ventilation, soundness of decks, sides, bulkheads, etc., is so well looked after by the master and owner that no reasonable complaint can, or would be made concerning them, by any competent Sanitary official. These vessels are sufficiently numerous to prove the truth of the contention that vessels of this class can be, and are constructed and maintained in such a manner, as to satisfy all the sanitary requirements, of the present standard. I repeat that such vessels do exist in plenty.

The question may reasonably be asked, if such vessels are actually in existence in large numbers, why should not all vessels of the same class be constructed and maintained in the same manner? In answering this question it is necessary to refer to Table XI. This Table indicates that, as far as steamships are concerned, the small vessels exhibit a marked proclivity to the existence of defective conditions, which further investigations show to be both structural, and due to the effects of wear and tear. Leaving out faulty initial construction, there are a large number of these defects which are due purely and simply to neglect. No

doubt these defects are in many instances small in character, but it must be recollected that they occur in connection with a very small space, a space in which the seaman has to sleep, to take his meals, and which is, in short, his home, and that, for this reason alone, they have a value which is far greater than appears on the surface. A leaky window is a small thing in a large room, but it becomes a matter of importance when the portlight in a confined fore-castle is concerned. Similarly with a leaky roof. Such need not be a great matter in a large building, but a leaky fore-castle head is a serious matter to the health and comfort of those who have to live in the necessarily limited space afforded by the fore-castle.

Such conditions are constantly liable to occur on all vessels. If they are attended to as soon as possible, they occasion, apart from discomfort, but little injury to health. If, on the other hand, a leaky fore-castle head is left alone, it only means that the leak grows, and the whole interior of the fore-castle becomes more or less damp and correspondingly injurious to health. I have often seen the bedding of a seaman quite wet, not merely damp, from this cause. The resulting injury to the man's health is obvious. It is for this reason, amongst others, that rheumatic ailments, colds, etc., are so frequent amongst seamen. Yet, if such a leak be stopped as soon as can reasonably be expected, the whole sequence of events is put a stop to. Similarly with regard to many other minor conditions. It will be advisable to discuss one or two of the conditions :

Lighting. The lighting of the seaman's accommodation is deemed to be sufficient if "when one third of the ports are closed it is possible to read the print of an ordinary newspaper, under suitable and fair conditions of daylight, *in any part of the space*, when the vessel is new and the paint clean."

This amount may be taken as a reasonable requirement. The invaluable influence of a plentiful supply of daylight *in* living rooms, for the proper preservation of the health of the inmates, is now universally recognised. It is not too much to say that a sufficient amount of daylight *in* a house is absolutely essential to health. If therefor a portlight be broken and then be covered up with tar, as is frequently the case, or,

as is also not infrequently done, be covered up with an iron plate, not only is the seaman mulcted of that amount of light to which he is legally entitled, but his health will suffer in some degree from the resulting want of daylight. I may say, that especially in small vessels, the amount of light, when the whole of the portlights are in good condition and all the circumstances are favourable, falls frequently far short of the amount required by law. Few competent observers will be found to dispute the statement that it is often impossible to read a newspaper in the fore-castle save when the paper is held up to the light. It is not of course possible to provide an unlimited supply of portlights for obvious reasons but I do maintain that such portlights as are provided should be kept available for the proper purpose. Such extraordinary devices as iron plates, a thick coating of tar, etc., are quite inadmissible on any grounds of health, to say nothing whatever about comfort, and merely exhibit contempt for the Regulations of the Board of Trade, and hide-bound ignorance and indifference to the most elementary laws of health.

Ventilation. Anyone who reads the Instructions to Surveyors issued by the Board of Trade, be will at once struck by the emphasis laid upon the question of the provision of a proper and sufficient system of ventilation. Of the value of ventilation from a health point of view, there can be absolutely no question.

Yet errors of ventilation are amongst the commonest defects with which the Sanitary Authority has to deal. Sometimes no ventilation is provided at all, though this is rare. In other cases the amount provided is inadequate. In other cases again the apparatus provided is sufficient, but the cowl of the ventilator is stowed away in the hold or lost altogether, and the ventilator closed over with a piece of canvas. In other cases, for example, the screw top forms, the screw rusts so that it becomes fixed in its socket and thus useless for ventilating purposes.

Defects of ventilation are almost invariably due to neglect and ignorance. A properly constructed ventilator, properly looked after, will last for years. Even the screw top type, which ought not to be fitted on any ship, can be kept in working order with a very little attention. It is really remarkable how frequently even this little attention is wanting.

Drainage of Forecastles. It is essential that all forecastles be provided with a proper drain. This drain will usually pass through a lamp locker or a W.C. on its way from the after end of the forecastle to the open air. Not infrequently it is found that instead of the drain being made of a pipe properly secured into the bulkhead between the forecastle and the W.C. or oil locker, and then carried out through the after bulkhead of the W.C., etc., on to the deck, that the pipe is dispensed with, and that as a result the forecastle opens directly into the W.C. through the hole in the bulkhead.

The result is a highly unsatisfactory and insanitary condition. It is furthermore a condition expressly forbidden by the Board of Trade. It is, however, a condition of frequent occurrence.

Insanitary conditions connected with Chain Lockers and Chains. I have often been asked what was the insanitary condition associated with an open chain locker. The question is one of extreme simplicity. Even in the instructions to surveyors issued by the Board of Trade, it is stated that chain cables and chain lockers must be so enclosed that effluvia may be prevented from reaching the forecastle. The reason is simply this, that when the anchor is dropped, say in a river, the mud sticks to the anchor and chain, and when the anchor is lifted some proportion of this mud adheres to and is carried down with the chain into the chain locker. There it decomposes and gives rise to nuisance.

In previous Annual Reports I have pointed out that the sanitary control of ships is vested in two mutually irresponsible bodies, viz., the Board of Trade and the Port Sanitary Authority.

The jurisdiction of the Board of Trade extends from the time that the building of the ship has begun, down to the end of the ship's existence. The jurisdiction of the Sanitary Authority begins, on the other hand, when the ship is first occupied by its crew, and ends when the ship ceases to be used for human habitation.

It is therefore obvious that the Board of Trade performs the functions of a sanitary authority whilst the sanitary arrangements of the ship

are being constructed, and that the Sanitary Authority proper has no say whatever in the matter. It is quite true that what shall constitute sanitary accommodation, from the point of view of the Board of Trade, is laid down in indefinite terms in the Merchant Shipping Act, terms which are considerably augmented and more clearly defined in the various "Instructions to Surveyors" issued by the Board of Trade from time to time. Thus it arises that the officials of the Board of Trade discharge the same duties during the construction of a ship as are discharged by the officials of an Urban Authority during the construction of a house. In the case of the house, however, the regulations and byelaws under which the house is built, and by which it is controlled during the whole time of its existence, are under the control of one authority whose position in the matter is clearly and precisely defined, and whose powers are properly laid down and circumscribed. Further, the individuals who perform the work of an Urban Sanitary Authority have been specially trained and specially selected on account of their proved capacity for dealing with the health conditions of the people.

It is not, I think, the same with the officials of the Board of Trade. Whilst fully recognising the admirable way in which the Board of Trade discharge the duties proper to an authority supervising trade matters, I submit that sanitary arrangements do not, properly speaking, come within their province. Sanitary matters require special knowledge, which means special training. I am not aware that the Surveyor of the Board of Trade is required to produce evidence of special sanitary knowledge. Hence I do not believe that any sanitarian would accept the verdict of the Board of Trade Surveyor on any matter which bears on the health conditions of those on board ship.

The effects of wear and tear on the various arrangements on board ship are constantly exhibiting themselves. These matters, which may have been quite right at the time that the surveyor gave his certificate, may be all wrong within a few months of the issue of the certificate. Yet the Board of Trade Surveyor has no legal right to inspect such a ship to discover the existence of faults in the arrangements. After his certificate has once been given, the Surveyor has no further power over the vessel unless complaint is made by some person concerning some matter,

or an application is made to the Board of Trade, by the owner, for a re-survey. It is also to be borne in mind that, even if the Board of Trade had the right of entry at all times for the purpose of discovering various conditions, they simply could not undertake the duty, as they have not got anything like a sufficiently numerous staff for the purpose. Hence we arrive at the fact that whilst the Board of Trade can control a ship previous to certification, they can in no way be said to exercise control during the life of the ship save under the circumstances I have mentioned. In order that there should be no confusion as to my meaning, it must be clearly understood that all that I have written refers purely and simply to the sanitary arrangements pertaining to the accommodation of those on board ship. It has been asserted in certain ill informed quarters that Port Sanitary Authorities desire to supersede the Board of Trade in all matters relating to the construction of ships. Nothing more absolutely fatuous and ridiculous, or more utterly false, could possibly be imagined. What Port Sanitary Authorities desire is to have the control of the construction of those sanitary arrangements on board ship which it is their duty to control and supervise during the life of the ship. Surely this is a reasonable enough suggestion. I am perfectly certain that all those who approach the subject calmly and dispassionately will agree that this suggestion is at least worthy of careful consideration.

I am strongly of opinion that such a control by the Port Sanitary Authority would result in mutual advantage to the shipowner and his crew. The advantage to the shipowner lies in the fact that his ship would in all cases fulfil a definite standard of requirement so far as its sanitary arrangements were concerned. The cost of these changes which Port Sanitary Authorities would require would not entail the expenditure of a single farthing more than is the case now, if carried out during the construction of the ship.

I feel quite sure that there will be a consensus of opinion that the accommodation of the crew is not all that could be desired. So far as passenger accommodation is concerned, it is all that could reasonably be required, for the simple reason that if a shipowner does not provide the best possible accommodation, then he will get no passengers, as there are plenty of other shipowners who will supply what is demanded. Hence I do not discuss this part of the question.

The accommodation of the seaman must necessarily be limited. Those who wish to increase greatly the cubic space of floor area required by law will find that the proposal will meet with the most strenuous opposition. In order to increase this cubic space, whilst employing the same number of men, it would be necessary to diminish, slightly only it may be, the cargo space, except in the case of deck houses, which, unfortunately, cannot always be provided. Hence, if Sanitary Authorities may not seek any improvement in this direction, they must direct their attention to those other points in connection with the sanitary arrangements of the vessel which can be improved without undue disturbance to the present conditions. It cannot be too strongly emphasized that Port Sanitary Authorities do not aim at any requirements which would in any way interfere with the commercial value of a vessel. Requirements of such a kind would simply be folly, and would necessarily be their own destruction. The aims of Sanitary Authorities lie more in the direction of some improvement in the existing conditions, and for that purpose, since it is, and will be, the duty of the Sanitary Authority to look after the sanitary arrangements on board ship during the life of the vessel, they desire to have control over the sanitary arrangements on board ship during the construction of the vessel.

The present position is unfair to the shipowner, unfair to the Board of Trade, and unfair to the Sanitary Authority. If the Sanitary Authority can be entrusted with the sanitary control of vessels during their commercial life, surely they can be entrusted with the control of their sanitary arrangements during their construction.

It cannot be too strongly insisted upon, that for the purposes of the Nuisances Section of the Public Health Act of 1875, a ship is a house. It follows, therefore, that legally the same standard of requirement, so far as the Nuisances Sections are applicable, obtains on board ship as in the house. If, however, we follow this position to its logical conclusion and apply the standard of the house to the ship, we immediately arrive at a ludicrous impasse. For example, the seaman is allowed by the Merchant Shipping Act 12 square feet of floor area and 72 cubic feet of air space. Whether this is enough or not is not now in question, but the question is, would such an amount be tolerated in a house? The answer is decidedly not. Yet a ship is a house within the meaning of the Public Health Act,

It is clear, therefore, that certain portions of the 1875 Act, which the Sanitary Authority have the power to use, are inapplicable. The Sanitary Authority therefore has to abide by the standard of the Merchant Shipping Act, an Act which it is not legally empowered to adopt. Legally Sanitary Authorities must act under the Public Health Act, but the Act which specifies the mode of construction of the sanitary arrangements on board ship and the accommodation of the crew is an Act administered by an independent authority, an Act furthermore, some at least of the provisions of which, are contrary to the spirit and provisions of the Act under which the Sanitary Authority are empowered to take procedure.

Such a position is impossible and would not be tolerated for a moment under any other circumstances. It is quite the case that merchant shipping existed long before Port Sanitary Authorities were even heard of, and that the only Authority which could deal with the matter was the Board of Trade. But I ask the question, why continue it now? The Board of Trade may certify, but they cannot, legally or otherwise, continue to exercise control, the necessity of which few will be prepared to deny. Certainly no one with practical experience will deny it.

I have already pointed out that so far as crew accommodation is concerned the only constantly controlling Authority is the Sanitary Authority. Occasionally the Board of Trade step in when requested. It is notable that the Surveyor of the Board *may* visit a ship on request; not must.

We therefore have two mutually irresponsible bodies acting under two acts, in some respects antagonistic. Need we wonder that confusion arises? That anything else should be the case would be a more legitimate cause of wonder.

I do not think that there should be any question that all sanitary arrangements should be in the hands of the Sanitary Authority. I consider that it is illogical to delegate powers to the Sanitary Authority after the accommodation has been constructed. For proper control, the power ought to be in the hands of the Sanitary Authority in the first

instance It is wrong that the power of dealing with nuisances should be in the hands of the Sanitary Authority whilst they have no say in the construction of those sanitary arrangements from whose fault the nuisance arises. The Sanitary Authority ought, as they are in the case of a house, to be responsible for the construction and maintenance in a sanitary condition of all the sanitary arrangements in connection with the seaman's accommodation.

There should be no question of two Authorities and two Acts. One code of requirement and one Authority is required, and that Authority must be the Sanitary Authority.

The necessity of community of action between the various Port Sanitary Authorities.

Arising out of this question of the sanitary control of shipping, there is one matter the importance of which it is impossible to overrate.

It is absolutely essential that the same standard of requirement should be aimed at by all Port Sanitary Authorities. There ought to be no question of divergence

It is, however, a regrettable but nevertheless an absolute fact, that the standard of requirement does vary, and varies considerably, in different Ports. The results of such diversity ought to be obvious even to the most superficial intelligence.

It is inevitable, under such conditions, that uncertainty will exist in the minds of shipowners as to what is the *real* standard of requirement.

Vessels are constantly coming under my notice which exhibit flat contradictions of the requirements of the Board of Trade, (contradictions whose nature may be judged from the Summary of Insanitary Conditions included in this report), and conditions giving rise to nuisance. Yet the defence often raised is "that these things have been in existence for so many years, that the ship has been in so many ports, that the vessel has actually been *inspected* and nothing has been said."

I have frequently noticed on the smaller class of vessel, that the Inspector has notified a condition, such as the absence of a ventilator. On account of the very short time that such vessels spend in port there has not been time, perhaps, for the ventilator to be put in position. The boat accordingly leaves port, and does not return to the Port of Manchester for some months, during all of which time she has been constantly calling at various ports in the kingdom. It is not infrequent to find that the matter has not been attended to, and that the Master has, indeed, forgotten all about it. In other cases the defect complained of is repaired, but seldom through action on the part of other Authorities, and scarcely ever through action by the Board of Trade, although an efficient system of ventilation is absolutely insisted on in the Instructions to Surveyors, issued by the Board of Trade.

Minor defective conditions, are extremely common, so common indeed that it seems impossible that there can be any controlling Authority in existence. I have said minor conditions, but it must be recollected that they occur in connection with a space which sails close to the margin of sanitary inefficiency. It is not possible to allow unhealthy conditions to exist in connection with a space of 72 cubic feet per man. This is a minimum allowance, and must be kept in the best condition possible, if the health of the crew is to be maintained.

This result cannot be attained otherwise than by constant attention on the part of the various Port Sanitary Authorities. If the Sanitary Authority do not bestir themselves things will get neglected, and insanitary conditions will result, to say nothing of the normal effects or wear and tear. With regard to the effects of wear and tear, it is too often the case that the results are neglected, a thing which should not occur with proper supervision.

Community of requirement will not be attained by the present system. Too much is left to the discretion both of the Surveyor of the Board of Trade and the Sanitary Inspector. The result, of course is, that one man will pass a condition which another will not, with the inevitable result of confusion. This is, however, unfortunately most

common, and will and must continue until a definite system is put in force. Divergence does not usually arise over mere accumulations of filth and conditions of uncleanness, but in respect of such matters as ventilation, lighting, etc.

In closet construction, for example, some Port Sanitary Authorities seem to be satisfied with a closet which has neither light nor ventilation. I have seen many cases where the closet was in pitch darkness and filthy in the extreme, as such a place could not avoid being, which have attracted no attention from a so called Sanitary Inspector.

It is obviously impossible for one Authority to set up a standard of requirement of its own. In a matter such as this, when a boat in its peregrinations, comes within the jurisdiction of many Authorities a common standard is essential.

The common standard does not exist at present, and could not possibly exist under the present conditions.

Until a definite, precise, and reasonable standard is established, the adoption of which will be compulsory on all Port Sanitary Authorities, there will be but little improvement in the accommodation of the seaman.

A series of byelaws, the adoption of which shall be compulsory, issued by the Local Government Board, and specifying in precise terms what shall constitute proper and sanitary accommodation would meet the requirements of the case.

TABLE I.

The following Table shows the number of vessels, British and Foreign, which have been inspected during the year :—

British Steam Ships	...	...	...	1429
British Sailing „	...	...	...	877
Foreign Steam „	...	...	...	275
Foreign Sailing „	...	...	...	40
Total	...	...	...	<u>2621</u>

The number of Re-visits made was 815

The total number of Inspections and Re-visits made thus amounts to :—

Inspections	...	...	...	...	...	2621
Re-visits	...	...	...	...	...	815
						<hr/>
Total	...	...	...	...	...	3436
						<hr/>

TABLE II.

The Nationalities of the vessels thus inspected were as follows :—

British	...	...	...	...	2306
Norwegian	...	...	...	...	175
German	...	...	...	...	58
Swedish	...	...	...	...	40
Danish	...	...	...	...	11
Belgian	...	...	...	...	8
Russian	...	...	...	...	5
Spanish	...	...	...	...	4
Italian	...	...	...	...	4
Austrian	...	...	...	...	4
French	...	...	...	...	4
Greek	...	...	...	...	2
					<hr/>
Total	...	...	...	...	2621
					<hr/>

TABLE III.

The Inspections, thus tabulated, were carried out at the under-mentioned positions in the Port :—

Manchester, Salford, and Stretford				
(including Mode Wheel)	...	...	...	1197
Runcorn	...	...	...	567
Weston Point	...	...	...	297
Ellesmere Port	...	...	...	175
Widnes	...	...	...	155
Astmoor Marsh (Wigg's Works)	...	...	...	81
Partington	...	...	...	55
Acton Grange	...	...	...	23

Eccles ... ..	...	...	...	15
Old Quay (Runcorn)	...	...	...	13
Davyhulme ...	...	...	...	12
Barton ... ..	...	...	...	9
Flixton ... ..	...	...	...	7
Warrington ...	...	...	...	7
Irlam... ..	...	...	...	5
Eastham ... ..	...	...	...	2
Irwell Park Wharf	...	...	...	1
Total ... ..	...	...	...	<u>2621</u>

TABLE IV.

Of the vessels thus inspected, the number showing defective or insanitary conditions was 1241

TABLE V.

The Nationalities of the vessels upon which defective or insanitary conditions were discovered, were as follows:—

British ... ..	...	...	...	1160
Norwegian ...	...	...	...	43
Swedish ... ..	...	...	...	12
German ... ..	...	...	...	11
Danish ... ..	...	...	...	4
French ... ..	...	...	...	3
Belgian ... ..	...	...	...	2
Russian ... ..	...	...	...	2
Spanish ... ..	...	...	...	2
Greek ... ..	...	...	...	1
Italian ... ..	...	...	...	1
Total ... ..	...	...	...	<u>1241</u>

TABLE VI.

The Defective or Insanitary vessels were found at the under-mentioned positions in the Port :

Manchester, Salford, and Stretford					
(including Mode Wheel)	...	...	...	...	396
Runcorn...	...	...	...	...	352
Weston Point	...	...	...	...	192
Ellesmere Port	...	...	...	...	110
Widnes ...	...	...	...	...	94
Astmoor Marsh (Wigg's Works)	...	...	...	...	51
Partington	...	...	...	...	14
Acton Grange	...	...	...	...	12
Old Quay (Runcorn)	...	...	...	...	7
Warrington	...	...	...	...	5
Davyhulme	...	...	...	...	3
Eccles ...	...	...	...	...	2
Barton ...	...	...	...	...	2
Flixton ...	...	...	...	...	1
Total ..					1241

TABLE VII.

These Tables show the number of vessels inspected, and the total number of vessels exhibiting sanitary defects to be as follows :—

Total Number.	No. Defective.	Percentage.
2621	653	47·35

TABLE VIII. (a) TYPE.

In order to arrive at a clear understanding of the meaning of the figures contained in the foregoing tables, it is necessary to classify the various units of which they are composed under the headings to which they can properly be referred.

For this purpose I have divided the total number of vessels inspected into three classes, viz.:—Steamships, Sailing Vessels, and Flats and Barges.

	No. Inspected.	No. Defective.	Percentage.
Steamships	1682	1241	38·82
Sailing Vessels ...	630	401	36·65
Flats and Barges ...	309	187	60·51
Total of all Classes	2621	1241	47·35

Expressed in the form of a Table, the percentage difference becomes very striking.

TABLE VIII. (b).

Class.	Percentage of the total number of vessels Inspected.	Percentage of the total number found defective.
Steamships	64·12	52·61
Sailing Vessels ...	24·10	32·33
Flats and Barges ...	11·78	15·06

The conclusion to be drawn from the above figures is this, that sailing vessels of the class inspected are much more liable to exhibit defective or insanitary conditions than steamships, and that flats and barges are equally at fault with sailing ships.

The experience of previous years amply and distinctly corroborates this conclusion.

It is clear that the type of the vessel, as exhibited in Table IX., has a very considerable bearing on the incidence of defective or insanitary conditions.

TABLE IX.—TONNAGE.

It is advisable, in order to still more clearly elucidate this point, to further classify the vessels inspected according to their tonnage.

SAIL.

Class of Vessels. Registered Tons.	No. of Veseels in class.	No. Defective.	Percentage.
1 to 250 ...	593	380	64·08
250 or over ...	37	21	56 75

STEAM.

Class of Vessels. Registered Tons.	No. of Vessels in class.		No. Defective.		Percentage.	
1 to 250	...	613	...	334	...	54.48
250 to 750	...	468	...	122	...	26.68
750 to 1250	...	198	...	59	...	29.79
1250 to 2000	...	149	...	66	...	44.29
2000 or over	...	254	...	72	...	28.46

BARGES.

Class of Vessels. Registered Tons.	No. of Vessels in class.		No. Defective.		Percentage.	
1 to 150	...	309	...	187	...	60.51

In the following Table the steamships inspected are arranged according to tonnage classification, and the number of vessels in each division is expressed in terms of percentages of the whole number of steamships inspected. The defective steamships are treated in a similar manner.

TABLE X.

Tons.	No. of Vessels in class.		No. of such Defective.	
1 to 250	613 or 35.44 per cent. of the total No. of steamships inspected.		334 or 51.14 per cent. of the total No. of steamships defective.	
250 to 750	468 or 27.82 per cent. of the total No. of steamships inspected.		122 or 18.99 per cent. of the total No. of steamships defective.	
750 to 1250	198 or 11.11 per cent. of the total No. of steamships inspected.		59 or 9.03 per cent. of the total No. of steamships defective.	
1250 to 2000	149 or 8.85 per cent. of the total No. of steamships inspected.		66 or 18.10 per cent. of the total No. of steamships defective.	
2000 or over	254 or 15.10 per cent. of the total No. of steamships inspected.		72 or 11.02 per cent. of the total No. of steamships defective.	

Total No. of Steamships ... 1682 ... 653

As regards sailing vessels, practically the whole number are included in the group 1-250 tons. The number in other groups are so small that they may be neglected.

As regards barges, the whole number inspected were under 150 tons registrar.

AGE.

It is frequently asserted that the probability of a ship exhibiting insanitary or defective conditions varies directly with the age of the vessel.

In order to test the accuracy of this statement, the following Tables have been compiled. In all cases where the age has been ascertained, it has been verified by reference to Lloyds' Register.

TABLE I.—KNOWN AGE.

Type.	No. of Vessels Inspected.	No. of these found Defective.	Percentage Defective.
All Classes, <i>i.e.</i> , Sail, Steam, and Barges...	2122	930	43.36

UNKNOWN AGE.

Type.	No. of Vessels Inspected.	No. of these found Defective.	Percentage Defective.
All Classes, <i>i.e.</i> , Sail, Steam, and Barges...	499	311	62.3
Total	2621	1241	47.35

The following Table clearly shows the total number of vessels in each class, together with the number found defective,

TABLE II.

Type.	TOTAL OF KNOWN AGE.			TOTAL OF UNKNOWN AGE.		
	No. Inspected.	No. Defective.		No. Inspected.	No. Defective.	
Sail	452	284		178	117	
Steam	1620	625		62	29	
Barges	50	21		259	166	
Total	2122	930		499	311	

TABLE III.

The figures of Table III., expressed in terms of percentages of defective or insanitary vessels, according as the age of the vessel is or is not known, reduce themselves to the following figures :—

	Percentage of Vessels of Known Age Defective	Percentage of Vessels of Unknown Age Defective.
Sail... ..	62·8	65·7
Steam	38·6	45·1
Barges	42·0	62·10

TABLE IV.

On the annexed Table the various vessels of *Known Age* have been classified according to the Age-Periods adopted in Lloyds' Register.

	TYPE OF VESSEL.								
	SAIL.			STEAM.			BARGES.		
	No. Inspected	No. Defective	Percentage Defective	No. Inspected	No. Defective	Percentage Defective	No. Inspected	No. Defective	Percentage Defective
40 or over...	84	51	60·7	11	5	45·4	1	1	100
40-20... ..	307	193	62·8	405	158	39	31	12	38·9
20-10... ..	42	30	71·4	433	201	44·3	15	7	46·6
10-5	8	5	62·5	253	96	37·9	3	1	33·3
Under 5	11	5	46·4	518	165	31·8	Nil	Nil	Nil
All ages	452	284	62·8	1620	625	38·6	50	21	42

TABLE XI.

CLASSIFICATION OF INSANITARY CONDITIONS.

The following are the Insanitary conditions found on vessels within the Port, classified under various headings :—

(1) STEAMSHIPS.

(1) Defective or Insanitary conditions occurring in connection with the accommodation provided for the Crew.

(a) Defects in connection with the Lighting of the Crew's Quarters.

Insufficient amount of light, owing to insufficiency				
in the means of lighting provided	...	...	...	14
Broken and leaky portlights	...	...	...	114
Insufficient amount of light, owing to the ports				
being covered with deck cargo, iron plates, &c.				16
Broken and leaky deadlights	...	...	...	16
Broken and leaky glass top to ventilators	..	...		3
Insufficient amount of light, owing to the deadlights				
being covered, or requiring cleansing and				
scraping	...	...	...	2
Total	....	.....		<u>165</u>

(b) Defects in connection with the Ventilation of the Crew's Quarters.

Ventilation deficient owing to insufficiency in the				
apparatus provided	...	...	...	66
Defective ventilators	...	...	...	111
Defective ventilation owing to the ventilators being				
covered with deck cargo	...	...	...	22
Air-pipe of ballast tank terminating in Crew's				
Quarters	...	...	...	6
Total	.....	..		<u>205</u>

(c) Defects in connection with the Heating Apparatus provided.

Defective stoves causing smoky forecastles	...	24
Defective stove-pipe causing smoky forecastle	...	25
No stove provided to quarters	... ..	3
No stove-pipe provided to stove	... ..	6
Steam heaters defective	... ..	2
Total.....		<u>60</u>

(d) Defects in the construction of the Sides, Floor, Deck, Bulk-heads, and of the various apparatus connected therewith, giving rise to, leakage into, accumulations of water in, and dampness generally of the Crew's Quarters.

Defective and insufficient drainage of the Quarters	4
„ Drainage Pipes	...
„ Pumps, causing water to accumulate	...
„ Ballast Tank causing leakage into the Q'ters	1
„ Decks	„ „ „ 31
„ Scuttles	„ „ „ 1
„ Portlights	„ „ „ 2
„ Hawse Pipes	„ „ „ 9
„ Chain Pipes	„ „ „ 2
„ Stove-pipe	„ „ „ 1
„ Steam Pipe	„ „ „ 1
„ Soil Pipe	„ „ „ 1
„ Ship's Side	„ „ „ 6
„ Flange of Fish Davit	„ „ „ 1
„ Windlass Bolt	„ „ „ 1
„ Capstan	„ „ „ 1
„ Waterway and Bolts	„ „ „ 1
„ Rivets	„ „ „ 1
Accumulations of stagnant water in quarters	... 39
Accumulations of stagnant water under quarters	... 6
Condensed moisture forming on the iron decks and beams over the bunks, causing damp bedding	13

No sheathing over iron deck or beams in quarters, sheathing broken and defective	...	..	12
Generally damp conditions	...	...	2
No pump provided to remove stagnant water	...		2
Uncapped sounding pipe of ballast tank opening in forecastle	...	...	10
Uncapped holes on top of ballast tank opening into forecastle...	...	..	4
Forecastle unfit for habitation, result of vessel having been in collision...	...	...	3
			<hr/> 158 <hr/>

(e) Defects arising from want of attention to the crew's accommodation and neglect of cleanliness.

Painting and limewashing required	..	...	79
Dirty forecastles, deckhouses, etc.	...	...	79
Accumulations of dirt, rubbish, and food refuse in quarters	...	...	32
Fittings in quarters in a state of dilapidation and requiring repairs	..	...	16
			<hr/> Total..... 206 <hr/>

(f) Defective construction of Bulkheads.

Defects allowing a water closet to be in direct communication with crew's quarters	1
---	----	-----	---

(g) Defective drainage of the forecastle, allowing communication with other parts of the vessel.

Communication between forecastle and water closet	21
„ „ „ paint locker	6
„ „ „ lamp and oil locker	7
„ „ „ galley	2
	<hr/> Total..... 36 <hr/>

(h) Defects in connection with Chain Locker and Chains.

Chain lockers open and unprotected in forecastle...	26
Chain pipe casing broken and defective	3
Unprotected chains passing through quarters ...	6
Total.....	<u>35</u>

(i) Insanitary conditions associated with the keeping of ship's gear, lamps, paints, oils, etc.

Ship's gear kept openly in forecastle	13
Paints, lamps, and oils kept openly in forecastle ...	3
Ship's gear, paints, lamps, and oils kept so as to be in direct communication with the forecastle	1
Total	<u>17</u>

(j) Defects in connection with the storage and keeping of food.

Food lockers without doors or fastenings	24
Food lockers requiring cleansing and limewashing or painting	4
Food lockers not provided	1
Food lockers defective and requiring repairs ...	2
Stores kept openly in cook's berth	1
Total... ..	<u>32</u>

(k) Uncertified accommodation occupied.

Uncertified and insanitary accommodation in engine room	1
Uncertified accommodation in Boatswain's store, the place being deficient in ventilation ...	1
Total	<u>2</u>

(l) Overcrowding 15

(m) Miscellaneous.

Steward's berth and pantry all in one	...	...	1
Lettering on beams absent, defective, or obliterated	...	...	5
			<hr/>
Total	.....		<u>6</u>

The total number of defective and insanitary conditions found in connection with the accommodation of the crew thus amounts to 938.

2 Defective or insanitary conditions in connection with the Water Closets provided for the use of the crews.

Water closet in a generally filthy condition	...	18
Water closet pans and pails broken and defective, and in a foul condition	... ..	23
Soil pipes broken and defective	... ..	5
Flushing apparatus broken and defective	... ..	121
Water closet seats absent, broken, or defective	... ..	4
Water closet doors absent or broken	... ..	1
Water closet fittings generally defective	... ..	21
Water closet deficient in ventilation	... ..	6
Water closet deficient in lighting	... ..	20
Water closet communicating directly with galley	..	1
No efficient water closet provided	... ..	3
Urinal in a choked, foul, or defective condition	... ..	3
Water closet fittings and pans absent	... ..	4
		<hr/>
Total	.....	<u>230</u>

3 Defective or insanitary conditions connected with the storage of water.

Water tanks requiring cleansing	... ..	11
Water casks in a decayed condition inside	... ..	2
		<hr/>
Total	.....	<u>13</u>

4 Accumulations of filth and dirt about the decks ... 15

The total number of defective or insanitary conditions found on board Steamships during 1904 thus amounted to... .. 1196

(2) SAILING VESSELS.

(1). Defective or Insanitary conditions occurring in connection with the accommodation provided for the crew.

(a) Defects in connection with the lighting of the Crew's Quarters.

Insufficient amount of Light, owing to insufficiency in the means of Lighting provided	...	...	26
Broken and leaky Deadlights	...	...	51
Broken and leaky glass top to Ventilators	..	...	2
Insufficient amount of Light owing to the dead-lights being covered, or requiring cleansing and scraping	..	...	16
Total.....			<u>95</u>

(b) Defects in connnction with the Ventilation of the Crew's Quarters.

Ventilation deficient owing to insufficiency in the apparatus provided	...	...	27
Defective Ventilators	...	...	96
Total.....			<u>123</u>

(c) Defects in connection with the Heating apparatus provided.

Defective stoves causing smoky forecastle	...	18
Defective stove-pipe causing smoky forecastle	...	25
No stove-pipe provided to stove	...	1
Total		<u>44</u>

(d) Defects in the construction of the Sides, Floor, Deck, Bulk-heads, and of the various apparatus connected therewith, giving rise to, leakage into, accumulations of water in, and dampness generally of the Crew's quarters.

Defective Decks causing leakage into the Quarters	45
„ Chain pipes „ „ „	1
„ Bulkhead „ „ „	1
Condensed moisture forming on the iron deck and beams over the bunks, causing damp bedding	2
Generally damp conditions	3
Forecastle sheets broken and defective	23
Total.....	<u>75</u>

(e) Defects arising from want of attention to the Crew's accommodation and neglect of cleanliness.

Painting and limewashing required	28
Dirty forecastles, deck-houses, etc.... ..	36
Accumulations of food refuse in quarters	2
Fittings in quarters in a state of dilapidation and requiring repairs... ..	3
Forecastle invested with vermin	1
Total.....	<u>124</u>

(f) Defective construction of Bulkheads.

Defects allowing a hold to be in direct communica- tion with crew's quarters	1
Defects allowing water to penetrate	4
Total.....	<u>5</u>

(g) Defects in connection with Chain Locker and Chains

Chain Lockers open and unprotected in forecastle	3
Chain pipe casing broken and defective	2
Unprotected chains passing through quarters ...	3
Total.....	<u>8</u>

(h) Insanitary conditions associated with the keeping of ships gear, lamps, paints, oils, etc.

Ship's gear kept openly in forecastle	...	...	55
Paints, lamps, and oils kept openly in the forecastle			19
Ship's gear, lamps, and oils kept so as to be in direct communication with the forecastle	...	...	24
Stores kept in the forecastle, combined with a generally insanitary condition so as to be unfit for human habitation	...	...	1
Total.....			89

(i) Defects in connection with the storage and keeping of food.

Food lockers without doors or fastenings	...	...	2
Food lockers requiring cleansing and limewashing or painting	...	...	2
Total			4

(j) Overcrowding 0

(k) Miscellaneous.

Cooking done in forecastle, causing place to be filled with smoke	1
---	-----	-----	---

The total number of defective or insanitary conditions found in connection with the accommodation of the crew thus amounts to 568

2 Defective or insanitary conditions in connection with the Water Closets provided for the use of the crews.

Water closets in a generally filthy condition	...	2
Water closet pans and pails broken and defective, or in a foul condition	...	28
Flushing apparatus broken and defective	...	8
Water closet seat absent, broken or defective	..	1
Water closets deficient in ventilation	...	33
Water closets deficient in lighting	...	33
No efficient water closet provided	1	1
Urinals in a choked, foul, or defective condition	...	3
Water closet fittings and pans absent	...	1
Total.....		111

3 Defective or insanitary conditions connected with the storage of water.

Water tanks requiring cleansing	...	...	...	17
„ „ defective allowing access to filth	...	...	...	7
„ „ inaccessible for cleansing purposes	...	...	...	4
„ „ requiring cementing inside	...	...	...	14
„ tank top immovable, making it impossible to cleanse tank	...	...	...	1
Water casks in a filthy condition inside	...	...	...	5
„ „ in a decayed condition inside	...	...	...	51
Total.....				<u>99</u>

The total number of defective or insanitary conditions found on board Sailing Vessels during 1904 thus amounts to 778.

NUMBERS AND NATIONALITIES OF CREWS ON VESSELS INSPECTED DURING 1904.

	Total No.			No. on Defective Vessels.
British	30,297
Norwegian	2,423
Lascars	1,856
German	1,071
Swedish	700
Spanish	300
Belgian	249
Danish	151
Austrian	100
Italian	64
Dutch	50
French	47
Russian	45
Greek	44
Totals.....				<u>37,397</u>
				<u>13,565</u>

FLATS AND BARGES.

The number of flats and barges registered under the Merchant Shipping Act inspected during the year was 309. Of these 187 or 60·51 per cent. showed defective or insanitary conditions.

The corresponding figures for the two previous years are as follows :—

Year.		No. Inspected.		No. Defective.		Percentage.
1902	.....	149	.....	90	.. ...	62·4
1903	... ..	195	.....	125	.....	64 1
1904	.....	309	.....	187	.....	60·51

There is thus but little improvement in the condition of these boats.

The number of defects found on the 187 defective vessels was 401, an average of rather more than two conditions per boat.

Several of the boats were in a bad state. In other cases the defects were minor ones.

I do not think that such boats, trading as they do constantly under the very eyes both of the Board of Trade and the Sanitary Authority, should show such a high percentage of defects.

It is not impossible to keep such boats in good condition. There are plenty in constant use which are as satisfactory as such boats can be. Still the number of defective barges shows the necessity of supervision.

The Board of Trade labours under the same difficulties with respect to flats and barges as it does in the case of the larger types of shipping, viz., lack of staff, and lack of power to deal with defects save under certain conditions. The only Authority which can exercise any control over the condition of barges is the Sanitary Authority. But the Public Health Act is not the proper Act in the circumstances.

As suggested in previous Reports, barges, flats, etc., should be registered under the Canal Boats Acts, not under the Merchant Shipping Act,

The result of this change would be that these boats would be required to fulfil a definite standard of requirement in the first instance, and it would be incumbent on the owner to satisfy a Sanitary Authority that the boat fulfilled the necessary conditions before he could obtain a certificate of registration. In this way the boat would be under the control of a Sanitary Authority during the whole period of its existence, and the owner would be responsible for the proper carrying out of one definite series of requirements, enforced by one type of Authority. At present he is in precisely the same position as the owner of a larger steamship, who, as I have already pointed out, is in the unfortunate position of being between two Authorities whose duties clash, but who are mutually irresponsible.

The Canal Boats Acts lay down a very definite standard of requirement, the adoption of which is incumbent on all Authorities, and thereby the danger of a different standard of requirement being set up by different Authorities is obviated.

The Canal Boats Acts have been of great value in the case of canal boats, and there is no reason why they should not confer equally great advantages on the boats under consideration.

It is wrong that 60 per cent. of these boats should show insanitary conditions. The existence of such a state of affairs is solely due to the failure of the Board of Trade to discharge the duties of a Sanitary Authority, duties which can only be properly performed by a properly equipped Sanitary Authority carrying out their work by means of properly trained inspectors.

FLATS AND BARGES.

Defective or insanitary conditions found on board Flats and Barges in connection with the accommodation provided for the crew.

(a) Defects in connection with the Lighting of the Quarters.

Insufficiency in the amount of lighting apparatus provided	78
Insufficiency in the amount of lighting owing to deadlight being broken and covered	1
Total.....	<u>79</u>

(b) Defects in connection with the Ventilation of the Quarters

Ventilation inefficient owing to insufficiency in the apparatus provided	9
Ventilators defective	19
Total	<u>28</u>

(c) Defects in connection with the Heating Apparatus.

Defective stoves causing smoky berths	3
Defective Stove-pipe causing smoky berths	7
Cabin overheated owing to position of stove	1
Total.....	<u>11</u>

(d) Defects in the construction and maintenance of the decks, floors, sides, bulkheads, and the apparatus connected therewith, causing dampness of the crew's quarters:—

Defective and leaky decks over crew's quarters	20
Defective skylights allowing water to penetrate	3
Defective dead lights allowing water to penetrate	30
„ scuttle „ „ „ „	1
Generally damp condition of the crew's quarters	1
No bed berths provided	1
Cabin deficient in headroom	1
Forecastle sheets broken and defective	1
Forecastle overheated owing to cooking being done in same	1
Chain cable unprotected in forecastle	1
Total.....	<u>60</u>

(e) Defects arising from want of attention to the crew's quarters and neglect of cleanliness.

Crew's quarters dilapidated and requiring repairs... ..	10
Cleansing and painting of quarters required	81
Foul bilges causing stench in crew's quarters	1
Defective bulkhead allowing access of dust and filth from the hold to the crew's quarters	6
Total.....	<u>98</u>

(f) Insanitary conditions associated with the keeping of ship's gear, lamps, oils, paints, etc.

Ship's gear, paints, oils, lamps, kept openly in quarters	14
Ship's gear, etc., kept openly in berth making same unfit for habitation	1
Total.....	<u>15</u>

(g) Defects in connection with the storage and keeping of food.

Food lockers requiring cleansing and painting ...	8
„ „ unventilated	1
Total.....	<u>9</u>

(h) Overcrowding 3

(i) Uncertified accommodation.

1. Adults occupying uncertified cabin 2

2. Defective or insanitary conditions connected with the storage of water.

Water casks in a decayed condition	25
„ „ „ position liable to contamination... ..	17
„ „ inaccessible for cleansing	2
Water tanks requiring cleansing and cementing	10
„ „ inaccessible for cleansing	13
„ „ in a position liable to contamination... ..	1
„ „ defective, allowing access to filth	10
Insufficient water supply on board	1
No efficient water vessel on board	5
Pipe leading to water tank requiring removing	2
Total.....	<u>86</u>

3. Defects or insanitary conditions in connection with the water closets provided for the use of the crew.

Water closet deficient in lighting	...	...	...	2
„ „ „ ventilation	...	...	...	2
Water closet pans broken and defective	...	...	...	5
Soil pipes defective	...	...	...	1
Total.....				<u>10</u>

The total number of insanitary conditions discontinued during 1904 in connection with flats and barges thus amounts to 401.

NOTICES UNDER THE PUBLIC HEALTH ACT, 1875, SERVED DURING THE YEAR.

The number of notices served during the year was 48. Of these, 28 was served on steamships, 12 upon schooners, and eight upon sloop flats, barges and ketches.

In 33 cases the notices were found to be complied with.

In the remaining 15 cases, the vessels have not been again inspected, so that it is impossible to say whether the notices have been complied with or not.

CATTLE BOATS.

The following are the particulars respecting the Cattle Trade of the Port during the year.

The cleansing of the boats continues to be carried out in a rapid and efficient manner.

The number of cattle imported show a large increase over previous years.

STEAMERS.	CATTLE			SHEEP		
	LANDED ALIVE	LANDED DEAD	LOST AT SEA	LANDED ALIVE	LANDED DEAD	LOST AT SEA
IBERIAN	4310	2	6			
BOSTONIAN	4281	1	12	4223	3	18
MANCHESTER CITY	3814		10	1815	1	11
CALEDONIAN	3512	1	6			
MANCHESTER COMMERCE ..	3429	9	14	1696	1	47
„ TRADER	2594	1	27	5036	16	103
„ CORPORATION... ..	1512	2	4			
„ EXCHANGE	907		1			
THESPIS... ..	889		1			
MANCHESTER MERCHANT ...	649					
TERENCE	559	1				
MANCHESTER IMPORTER ...	521			490		
TINTORETTO	310					
TITIAN... ..	280					
Total	27,567	17	81	13,260	21	179

In addition to the above the "MANCHESTER CITY" landed alive 2 horses.

STEAM LAUNCH.

I have pleasure in again reporting that the launch has worked satisfactorily during the year.

The vessel is in as good condition as she was when purchased by the Authority.

The engines and boiler are in excellent condition.

The men employed on the launch have discharged their duties in an entirely satisfactory manner.

The action of your Authority in providing an office for the use of the Medical Officer of Health has been amply justified.

There can be no doubt that, for administration purposes, such an office was required.

The amount of work now carried out by your Authority is so great that, without such provision, it would inevitably have got into a condition of inextricable confusion.

Prior to the establishment of this office it was a matter of great difficulty to keep in touch with the work carried on. It is now, however, possible to follow every detail easily.

By means of a simple system of bookkeeping the history of every vessel, alike in regard to its record for sickness and in regard to its sanitary condition, is kept in such a manner that a moment's reference will provide all the information required.

REPORT on the Administration of the Canal Boats Acts, 1877 and 1884, for the year ending, the 31st December, 1904.

1. The Inspectors have been appointed by the Authority to carry out the provisions of the Canal Boats Acts.

Their names and addresses are as follows :

H. ATKINSON, 584, Chester Road, Old Trafford, Manchester.

W. RICHMOND, 22, Waterloo Road, Runcorn.

Both of these Inspectors have the Certificate of the Sanitary Institute, certifying as to their knowledge of the principles of Sanitary Science so far as they apply to the work of a Sanitary Inspector.

Neither Inspector can devote his whole time to the duties of an Inspector under the Canal Boats Acts. Their primary duty is the supervision of Shipping registered under the Merchant Shipping Act. Their duties as Canal Boats Inspectors are superimposed thereon and they are only supposed to inspect Canal Boats at such times as can conveniently be managed.

For purposes of administration the Port is divided into two sections, viz : from Eastham to Latchford including Widnes and Warrington, Headquarters Runcorn ; and from Latchford to Manchester, Headquarters, Manchester. Each section is under the control of one of the Inspectors who is directly responsible to the Port Medical Officer for the proper supervision of his district.

In order to facilitate inspection, the Authorities Steam Launch is in constant use, so that Canal Boats can be inspected at any time or place within the Port.

This arrangement is found to work entirely satisfactory.

2. I have again pleasure in reporting that the amount of work done during the year shows an increase as compared with that accomplished in the previous year.

The numbers of boats inspected, together with the number of boats discovered infringing the terms of the Acts since the Authority undertook this duty, are as follows ;—

Year		Number Inspected		Number Infringed
1902	.....	73	.....	31
1903	.....	191	.....	77
1904	... ..	230	.....	105

The number of boats showing infringements of the Acts this year was 105, or, in terms of percentages, 45·65 per cent. of the number inspected.

The total number of infringements of the Acts was 174. The average number of infringements per boat was thus 1·6.

Of the total number of boats inspected 104 were inspected at the Manchester end of the Canal. Of these 36 showed infringements. In other words, 36·6 per cent. of these boats infringed the Acts.

Sixty infringements were discovered on these boats. The average number of infringements on each boat was thus 1·6, the same as for the total number.

At the Runcorn end of the Canal 126 boats were inspected. Of these 69 exhibited infringements. In other words, 54·76 per cent. of the boats infringed the Acts.

114 infringements were found on these boats, an average of 1·6 infringements per boat.

A comparison of these results is of interest. We find that 54·8 per cent. of the total number of boats were inspected at Runcorn, and that 45·2 per cent. of the total number of boats inspected were inspected at Manchester.

Of the number of boats infringing the Acts 65·7 per cent. were discovered at Runcorn and 34·3 per cent. at Manchester. In other words, nearly twice as many boats exhibited infringements at Runcorn as was the case in Manchester.

Of the total number of infringements discovered 65·5 per cent. occurred at Runcorn, whilst 34·5 per cent. occurred at Manchester. In other words, nearly twice as many infringements were discovered at Runcorn as at Manchester

These results exhibit a striking difference between the two places, a difference which, however, is not so marked as was the case in the previous year, 1903. In that year the number of infringing boats discovered at Runcorn was nearly two and a half times greater than was the case at Manchester, whilst the infringements were nearly five times more numerous.

There is thus a marked levelling up in the conditions prevailing at the two ends of the Canal, a change which I can only ascribe to the action of your Authority.

The explanation of the discrepancy between the results of the work done at Runcorn and that at Manchester does *not* lie in any difference in the standard of requirement at the two places, as the duties of the Inspectors are clearly and precisely laid down, and are identical for each end of the Canal. It seems to me that the explanation lies in the difference in the degree of enforcement of the Canal Boats Acts by the Riparian Authorities. There can be no question but that the terms of the Canal Boat Acts have been more fully enforced by the Authorities at the Manchester end of the Port than by the Riparian Authorities at the other end of the Port.

On this point much light is shed by the able Report to the Local Government Board by the Chief Inspector of canal boats. The Inspector points out that the condition of the canal boats in a district, so far as their fulfilment of the terms of the Canal Boats Acts are concerned, varies with the activity of the Local Authority in enforcing the provisions of the Acts.

I can affirm, without fear of contradiction, that the only way whereby canal boats can be kept in condition at all approaching sanitary efficiency, is by *frequent, sufficient, and efficient* inspection, by thoroughly trained and competent inspectors. If the inspection be in any way lax

or insufficient these boats will be found to fall far short of the attainment of sanitary efficiency. Cursory or inefficient inspection simply invites carelessness and indifference on the part of the crews of such boats, who belong to a class of people so sunk in ignorance and indifference that they cannot be entrusted with any matter bearing on the question even of their own health. The difficulty in carrying out the provisions of the Acts lies neither in the terms of the Acts, which are reasonable and proper in the extreme, so far as they go, nor in the lack of will on the part of the *majority* of owners to carry out their obligations, but in the stupefying ignorance of the crews of the boats and the culpable indifference of Local Authorities in the execution of their duties under the Acts.

It must be recollected that the accommodation allotted by the Acts is, and must be, a minimum. For this reason alone it is essential that this minimum shall be the best possible in the first instance, and *must be kept* in the best possible condition in the interests of the crews, the owners, and the public.

Local Authorities have the matter in their own hands if they choose to exercise their powers.

Generally speaking the condition of the boats was good, especially at Manchester. In the light of experience as to the conditions of flats and barges registered under the Merchant Shipping Act, an average of 1·6 defects per defective boat is *not* high. It is, of course, inevitable as a necessary resultant of wear and tear that something should go wrong on board such vessels, especially considering that, even at the best, they sail so perilously close to the margin of sanitary inefficiency.

I have found that the condition of a certain number of boats, a small number, I am glad to say, is dependent upon a class of owner who, no doubt relying on the *laisse fairez* policy of many Local Authorities, allow their boats to go on getting into a worse and worse condition until pulled up by some Authority. Such individuals, I find, will then fulfil the letter of the law, if, and only if, they think that the Authority “means business.”

Other owners, on the other hand, take a personal interest in their boats, and in such instances it is not only the exception to find anything the matter with their boats, but even the boats themselves are constructed and found in a manner which goes far beyond the actual requirements of the Canal Boats Acts.

3. The following is a summary of the conditions found during the year, arranged according to the classification recommended by the Local Government Board :—

(a) Registration.						
Not registered	...	...	...	...	...	0
(b) Notification of change of Master						
	...	...	...	...	...	0
(c) Certificates.						
Not identifying owner with boat	...	...	...	...	...	12
Registration certificate absent	...	...	...	...	...	9
Registration certificate so dilapidated as to be illegible	...	...	...	...	...	10
(d) Marking. No Marks						
	...	...	...	...	...	3
Marking very indistinct	...	...	...	...	...	12
(e) Overcrowding						
	...	...	...	...	...	4
(f) Separation of the sexes						
	...	...	...	...	...	3
(g) Cleansing.						
Cabin requiring cleansing	...	...	...	...	...	7
Cabin dilapidated and requiring repairs	...	...	...	...	...	15
Defective deck, or sides, or both, causing leakage into the cabin	...	...	...	...	...	23
Defective footboard causing leak into cabin	...	...	...	...	...	2
(h) Ventilation.						
Ventilation deficient	...	...	...	...	...	10
Ventilation deficient owing to the ventilators being covered with deck cargo	...	...	...	...	...	0

(i) Painting.					
Cabin requiring painting	...	...	...	...	36
(j) Provision of Water Cask.					
No water cask on board	...	...	...	...	14
No efficient water cask on board	...	...	...	...	2
Water cask decayed and unfit for further use	...	...	...	...	2
(k) Removal of bilge water.					
Bilge pump absent	...	...	...	...	5
Bilge pump broken and defective	...	...	...	...	5
(l) Notification of Infectious Disease					
...	...	...	...	...	0
(m) Admittance of Inspector					
...	...	...	...	...	0
Total					<u>174</u>

Certain other conditions were discovered which are in themselves likely to give rise to nuisance-

(n) Other conditions.					
Absence of any means of lighting	...	...	...	...	39
Defective stove pipe causing smoky cabin	...	...	...	...	7
Defective stove causing smoky cabin	...	...	...	...	7
Water cask kept in a position liable to contamination	...	...	...	...	15
Water tank inaccessible for cleansing	...	...	...	...	2
Ropes and gear kept openly in cabin	...	...	...	...	1
					<u>55</u>

It is to be noted that these conditions occurred in all except four instances on boats which directly infringed the Canal Boats Acts. The four boats aforementioned are not included in the list of infringing boats.

4. No legal proceedings have been taken during the year, as no circumstances have arisen requiring legal interference.

5. The only steps taken to secure compliance with the Acts have been the issue of complaint notes in cases where required. In all instances save one, these notes have been returned within, or shortly after, the time limit stated therein.

6. No cases of infectious disease have required to be dealt with.

ANALYSIS OF WORK DONE FROM 1897 to 1894.

The following comparative statement of the amount of work done by your Authority, from 1897 down to the end of 1904, may be of interest :

Year.		No. of Vessels.		Tonnage.	
1897	.....	1028	... ..	722,897	Foreign
	.....	4297	.....	554,536	Coasting
1898	.....	1014	.....	764,005	Foreign
	.....	5956	.....	696,882	Coasting
1899	.....	962	.....	828,666	Foreign
	.....	4336	.....	651,159	Coasting
1900	.....	1002	.....	923,800	Foreign
	... ..	4443	.....	636,058	Coasting
1901	.....	986	.....	896,512	Foreign
	.....	4102	.....	631,020	Coasting
1902	.....	1150	.....	1,131,121	Foreign
	.....	4539	... ..	704,663	Coasting
1903	.....	1191	... ..	1,292,214	Foreign
	.. ...	4260	.. ...	696,454	Coasting
1904	.....	1245	.....	1,308,757	Foreign
	.....	4729	.....	689,248	Coasting

The expansion of trade may be further exemplified by comparing the total of shipping inwards, along with tonnage, for the eight years:—

Year.	Total Shipping Inwards.		Total Tonnage Inwards.	
1897	5325	.....	1,277,433
1898	5970	.....	1,460,887
1899	5298	.....	1,479,825
1900	5445	.....	1,559,856
1901	5088	.....	1,527,532
1902	5699	.....	1,836,784
1903	5451	.....	1,988,668
1904	5974	.....	1,998 005

The total number of vessels inspected within the port, together with the total number and percentages of defective vessels;—

Year.	No. Inspected.		No. Defective.		Percentage.	
1897	790	.....	86	.....	10·8
1898	1346	.....	263	.....	19·5
1899	1294	.....	251	.....	19·4*
1900	1610	.....	231	.....	14·4*
1901	1344	.....	263	.....	19·5
1902	2477	.....	870	.....	35·1
1903	2385	.....	916	.....	38·4
1904	2621	.....	1241	.....	47·35

Comparison as to the number of vessels inspected at various points within the Port:—

Year.	Manchester and Salford.		Runcorn.		Ellesmere Port.		Widnes.		Other Ports.	
1897	...	543	...	158	...	39	...	28	...	22
1898	...	762	...	386	...	111	...	60	...	27
1899	...	667	...	308	...	108	...	43	...	168*
1900	...	619	...	331	...	80	...	63	...	517*
1901	...	861	...	313	...	70	...	66	...	34
1902	...	1194	...	862	...	137	...	174	...	110
1903	...	1087	...	787	...	192	...	206	...	163
1904	...	1186	...	968	...	175	...	155	...	137

*Extra Inspector at Eastham.

The positions on the Port where the insanitary conditions were discovered were as follows:—

Year.	Manchester and Salford.		Runcorn.		Ellesmere Port.		Widnes.		Other Ports.	
1897	...	56	...	21	...	4	...	5	...	0
1898	...	138	...	96	...	17	...	11	...	1
1899	...	148	...	70	...	18	...	10	...	5
1900	...	144	..	67	...	9	...	11	...	0
1901	...	172	...	63	...	15	...	13	..	0
1902	...	263	...	437	...	72	...	83	...	15
1903	..	324	...	340	...	105	...	108	...	39
1904	...	401	...	602	...	110	...	94	...	34

SHIPPING INWARDS TO THE PORT OF MANCHESTER.

FROM JANUARY 1ST TO DECEMBER 31ST, 1904.

	MANCHESTER.		RUNCORN		ELLESMERE PORT.		WIDNES		WARRINGTON.		TOTALS.	
	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage
Foreign { STEAMERS . SAILING.....	1,002	1,179,445	102	43,591	36	25,621	—	—	49	29,012	1,189	1,277,669
	1	281	38	23,584	15	6,764	1	93	1	366	56	31,088
Total Foreign...	1,003	1,179,726	140	67,175	51	32,385	1	93	50	29,378	1,245	1,308,757
Coastwise { STEAMERS... SAILING.....	1,851	410,709	796	93,790	324	43,553	678	45,014	31	2,871	3,680	595,937
	59	6,045	721	66,109	99	9,776	147	9,932	23	1,449	1,049	93,311
Total Coastwise	1,910	416,754	1,517	159,899	423	53,329	825	54,946	54	4,320	4,729	689,248